STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

DATE: February 25, 2016

FROM: Matt Urban
Wetlands Program Manager

AT (OFFICE): Department of Transportation
Bureau of Environment

SUBJECT Dredge & Fill Application
Concord, 16287

TO Gino Infascelli, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by NH DOT Bureau of Highway Design for the subject Minor impact project. This project is classified as Minor per Env-Wt 303.03(h). The Department proposed to replace two failing existing culverts under the I-393 highway and slipline a third culvert as part of the needed infrastructu4re improvements.

This project was reviewed at the August 15th and September 16th Natural Resource Agency Coordination meetings. The minutes from those meeting can be reviewed via the following link: http://www.nh.gov/dot/org/projectdevelopment/environment/units/project-management/nracrmeetings.htm

This project requires mitigation in the amount of $40,800 in the form of a single one-time in-lieu fee payment into the Arm-Fund.

Due to a slight increase in impacts prior to this applications submittal to NHDES, two payment vouchers were processed to achieve the full application fee that is required. The total fee required is in the amount of $3,920.00. The first voucher was processed in the amount of $3,910.00 (Voucher #427639). The second voucher currently being processed is in the amount of $10.00. The Department is still waiting for an official voucher number for this additional amount. When the official second voucher number is acquired the Department will email Gino Infascelli directly informing him of the voucher number so that he can forward it to the appropriate parties at NHDES.

The lead people to contact for this project are Tobey Reynolds, Highway Design (271-2171 or treynolds@dot.state.nh.us) or Matt Urban, Wetlands Program Manager, Bureau of Environment (271-3226 or murban@dot.state.nh.us). If and when this application meets with the approval of the Bureau, please send the permit directly to Matt Urban, Wetlands Program Manager, Bureau of Environment.

MRU:mru
cc:
BOE Original
City of Concord (4 copies via certified mail)
NH DOT Bureau of Construction
Darrell Elliott, Environment
Carol Henderson, NH Fish and Game
Maria Tur, USF&WS
Mark Kern, EPA
Michael Hicks, US Army Corp of Engineers
Edna Feighner, (Programmatic Agreement within)
Merrimack River Local Advisory Committee (via certified mail)
S:\Environment\PROJECTS\CONCORD\16287\WETAPP - Design.doc

NHDES-W-06-012

WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau
Land Resources Management

Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: RSA 482-A/ Env-Wt 100-900

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

1. REVIEW TIME:
Indicate your Review Time below. Refer to Guidance Document A for instructions.

☒ Standard Review (Minimum, Minor or Major Impact) ☐ Expedited Review (Minimum Impact only)

2. PROJECT LOCATION:
Separate applications must be filed with each municipality that jurisdictional impacts will occur in.

ADDRESS: **Interstate 393 between Exit 1 and 2** TOWN/CITY: **Concord**

TAX MAP: **114** BLOCK: LOT: UNIT:

USGS TOPO MAP WATERBODY NAME: **Merrimack River** ☐ NA STREAM WATERSHED SIZE: ☐ NA

LOCATION COORDINATES (If known): **1,024,886E, 263,149N**
☒ State Plane ☐ Latitude/Longitude ☐ UTM

3. PROJECT DESCRIPTION:
Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

NHDOT proposes to replace two failing existing culverts under the I-393 highway and slipline a third culvert as part of the needed infrastructure improvements that includes 9 wetland impact areas associated with the temporary access and construction work which includes replacement of the drainage pipes along this portion of the project. The 9 impacts total to 19,600 SF with 3,935 SF permanent and 15,665 SF temporary. The details are attached.

4. SHORELINE FRONTAGE

☐ NA This lot has no shoreline frontage. SHORELINE FRONTAGE: **650+/-**

Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

5. RELATED PERMITS, ENFORCEMENT, EMERGENCY AUTHORIZATION, SHORELAND, ALTERATION OF TERRAIN, ETC...

EMERGENCY AUTHORIZATION (PERMIT NUMBER 2015-03137) AND NHDES Shoreland Permit

6. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:
See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB 16 - 0230

b. ☒ Designated River the project is in ¼ miles of: **Merrimack River** ; and date a copy of the application was sent to the Local River Management Advisory Committee: Month: 2 Day: 25 Year: 16
☐ NA

7. APPLICANT INFORMATION (Desired permit holder)

LAST NAME, FIRST NAME, M.I.: **Tobey Reynolds - Project Manager**

TRUST / COMPANY NAME: **NHDOT** | MAILING ADDRESS: **7 Hazen Drive**

TOWN/CITY: **Concord** | STATE: **NH** | ZIP CODE: **03301**

EMAIL or FAX: **BUR16@dot.state.nh.us** | PHONE: **271-2171**

ELECTRONIC COMMUNICATION: By initialing here: _____, I hereby authorize NHDES to communicate all matters relative to this application electronically

8. PROPERTY OWNER INFORMATION (If different than applicant)

LAST NAME, FIRST NAME, M.I.:

TRUST / COMPANY NAME: | MAILING ADDRESS:

TOWN/CITY: | STATE: | ZIP CODE:

EMAIL or FAX: | PHONE:

ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically

9. AUTHORIZED AGENT INFORMATION

LAST NAME, FIRST NAME, M.I.: **Michael Leach** | COMPANY NAME: **Stantec Consulting Services, Inc.**

MAILING ADDRESS: **5 Dartmouth Drive - Suite 101**

TOWN/CITY: **Auburn** | STATE: **NH** | ZIP CODE: **03032**

EMAIL or FAX: **michael.leach@stantec.com** | PHONE: **669-8672 x-7538**

ELECTRONIC COMMUNICATION: By initialing here **ml**, I hereby authorize NHDES to communicate all matters relative to this application electronically

10. PROPERTY OWNER SIGNATURE:

See the Instructions & Required Attachments document for clarification of the below statements

By signing the application, I am certifying that:

1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application.
2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document.
3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900.
4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type.
5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative.
6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47.
7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance.
8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project.
9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate.
10. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action.
11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining.
12. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not

Property Owner Signature	Print name legibly	Date
Tobey Reynolds	Tobey Reynolds	2/16/16

MUNICIPAL SIGNATURES

11. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

⇨	Print name legibly	Date

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review ONLY requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will reviewed in the standard review time frame.

12. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

⇨ Town/City Clerk Signature	Print name legibly	Town/City	Date

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. IMMEDIATELY sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery.

13. IMPACT AREA:
For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact
Permanent: impacts that will remain after the project is complete.
Temporary: impacts not intended to remain (and will be restored to pre-construction conditions) after the project is complete.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.		TEMPORARY Sq. Ft. / Lin. Ft.	
Forested wetland		☐ ATF		☐ ATF
Scrub-shrub wetland		☐ ATF		☐ ATF
Emergent wetland	2,250	☐ ATF	9,750	☐ ATF
Wet meadow		☐ ATF		☐ ATF
Intermittent stream		☐ ATF		☐ ATF
Perennial Stream / River	1,075 / 85	☐ ATF	4,000 / 215	☐ ATF
Lake / Pond	225 /	☐ ATF	/	☐ ATF
Bank - Intermittent stream	/	☐ ATF	/	☐ ATF
Bank - Perennial stream / River	385 / 85	☐ ATF	1915 / 165	☐ ATF
Bank - Lake / Pond	/	☐ ATF	/	☐ ATF
Tidal water	/	☐ ATF	/	☐ ATF
Salt marsh		☐ ATF		☐ ATF
Sand dune		☐ ATF		☐ ATF
Prime wetland		☐ ATF		☐ ATF
Prime wetland buffer		☐ ATF		☐ ATF
Undeveloped Tidal Buffer Zone (TBZ)		☐ ATF		☐ ATF
Previously-developed upland in TBZ		☐ ATF		☐ ATF
Docking - Lake / Pond		☐ ATF		☐ ATF
Docking - River		☐ ATF		☐ ATF
Docking - Tidal Water		☐ ATF		☐ ATF
TOTAL	3,935 / 170		15,665 / 380	

14. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

☐ Minimum Impact Fee: Flat fee of $ 200

☒ Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking)	**19,600** sq. ft.	X	$0.20 =	**$ 3,920.00**
Temporary (seasonal) docking structure:	sq. ft.	X	$1.00 =	$ -
Permanent docking structure:	sq. ft.	X	$2.00 =	$ -
Projects proposing shoreline structures (including docks) add $200			=	$ -
			Total =	**$ 3,920.00**
The Application Fee is the above calculated Total or $200, whichever is greater			=	**$ 3,920.00**

NHDES-W-06-013

WETLANDS PERMIT APPLICATION – ATTACHMENT A
MINOR AND MAJOR - 20 QUESTIONS

Water Division/ Wetlands Bureau/ Land Resources Management

Check the Status of your application: http://des.nh.gov/onestop

RSA/ Rule: RSA 482-A, Env-Wt 100-900

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

The proposed impacts are needed replace two existing CMP culverts under I-393 that are in failure and have partially collapsed (54" and 48") and to repair one existing 36" CMP culvert. All three culverts were constructed in the 1980's and have reached the design life of structures. With I-393 being a major highway that serves the surrounding area, the impacts are needed to maintain the existing roadway infrastructure and the demands of the public before failure of the culverts occurs and damages the roadway. A majority of the impacts are temporary for construction. The wetland application is for the impacts associated with the necessary infrastructure maintenance under this project. The accompanying plans identify the associated impacts to the wetlands for the project. Recently the 48" CMP culvert partially collapsed and emergency repair was conducted under 2015-03137 and this application is also to complete the work for the 48" culvert.

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

The project proposes nine (9) impact areas that total to 19,600 SF of impact with 3,935 SF associated with permanent impacts and 15,665 SF associated with temporary impacts for all three culverts. In addition, temporary and permanent impacts to the 100-year flood plain are proposed with approximately 7,440 CF of permanent impact to the 100 year flood plain and 7,610 CF compensatory volume being created and provided under this application. To the extent practical, the proposed impacts are located in areas that were previously disturbed during construction of the existing highway and drainage systems to minimize the project impacts. The alternate proposed is the most practical to construct that maintains the existing drainage flow during construction, minimizes impacts to the public/motorists, minimizes impacts to the roadway embankments, and minimizes impact to the wetlands and shoreland areas. The existing 48" and 54" culverts will maintain the existing flow patterns during construction until the new culverts are installed and graded, and stone fill placed. The proposed culverts are in close proximity to the existing culverts and located westerly of the existing culverts. The proposed new culverts will have the same invert elevations to maintain and retain the existing hydrology to upstream and downstream areas. Once the new 48" and 54" culverts are operational, the existing culverts will be flowfilled and plugged at each end to prevent further failure.

The existing 36" culvert will be sliplined and the invert areas restored and stabilized with stone fill. Most of the impact at each end is temporary during construction associated with the installation of the sliplining.

All unavoidable impacts have been minimized to the extent practical for proper culvert replacement and repair construction, and to meet the purpose of the regulations. The proposed project is intended to maintain the current wetland function and values upon completion.

3. The type and classification of the wetlands involved.

All of the wetlands are freshwater wetlands being either marshes or swamps with some containing open water components. At the upstream end of the 36" pipe, the marsh is generally classified as PEM1E/SS1E with the perimeter having the shrub component. The marsh at the downstream end of the 36" culvert and upstream end of the 48" culvert is generally classified as PEM1E/SS1E. The downstream end of the 48" culvert is Riverine and appears to have been excavated to allow the existing culvert to drain to the backwater portion of the Merrimack River. This location would be generally classified as R2UBHx. For the 54" culvert, the downstream portion is Riverine and appears to be partially natural and partially filled by the roadway embankment and being generally classified as R2UBH. The wetlands located westerly of the culvert and located at a higher elevation and in proximity to the proposed new 54" culvert outlet would be generally classified as PFO1E. The upstream end of the 54" culvert would be generally classified as PEM1/2F;SS1E with the center portion being open water (OW) and the perimeter being the scrub/shrub portion.

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The nearest surface water is the Merrimack River, a perennial stream. The downstream (northerly side) of the 48" & 54" culverts are located along a backwater riverine area of the Merrimack River subject to flooding and the culverts are entirely located within the 100-year floodplain of the river. The existing 48" and 54" culverts act as equalizer pipes to the south side of the highway and associated wetlands, and that is maintained with the proposed culverts. The 54" and 48" culverts inlets are located in different /separate wetland areas. The 100-year flood plain fill impact (7,440 CF) and compensatory mitigation creation (7,610 CF) occur at the upstream end of the 54" culvert.

The 36" pipe appears to act as an equallzer pipe between the wetlands on both sides of the I-393 highway with the pipe elevations indicating it drains southerly. The northerly wetland is a large pocketed area. The wetland area at the outlet end of the 36" culvert is contiguous with the upstream wetland area of the 48" culvert.

A separate shoreland permit application will be filed for the impacts to the Shoreland Area associated with the Merrimack River under this project.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

The NHI review for the project (NHB16-0230) includes a natural community that was not listed in the previous NHB 15-0292 for the project. Correspondence from National Heritage is included with this application for the natural community and the listed plant species indicating no concerns thus the project does not indicate any rarity for the wetlands or surface waters. The project does not have any sand dunes or tidal buffer zones.

6. The surface area of the wetlands that will be impacted.

Impact A - 4,925 SF total impact with 1,375 SF permanent impact and 3,550 SF temporary impact.

Impact B - 225 SF total permanent impact.

Impact C - 2,950 SF total impact with 950 SF permanent impact and 2,000 SF temporary impact.

Impact D - 1,300 SF total temporary bank impact.

Impact E - 2,125 SF total impact with 125 SF permanent impact and 2,000 SF temporary impact.

Impact F - 5,650 SF total impact with 650 SF permanent impact and 5,000 SF temporary impact.

Impact G - 775 SF total impact with 125 SF permanent and 650 SF temporary.

Impact H - 650 SF total impact with 100 SF permanent and 550 SF temporary.

Impact I - 1000 SF total impact with 385 SF permanent impact and 615 SF temporary impact.

Total wetland impact: 19,600 SF with 3,935 SF permanent impact and 15,665 SF temporary impact.

Note: Impact E has approximately 60 SF of stone fill that was installed for the emergency work and is considered temporary because it is to be restored to pre-emergency work conditions. All other impacts associated with the Emergency Authorization are considered temporary because the impacts will be restored to pre-emergency work conditions.

7. The impact on plants, fish and wildlife including, but not limited to:
   a. Rare, special concern species;
   b. State and federally listed threatened and endangered species;
   c. Species at the extremities of their ranges;
   d. Migratory fish and wildlife;
   e. Exemplary natural communities identified by the DRED-NHB; and
   f. Vernal pools.

A response from the Department of Resource and Economic Development relative to the New Hampshire National Heritage Inventory (NHI) for the project area has been received under NHB16-0230 indicates Bald Eagle - threatened; Blandings' turtle - endangered; and Northern Leopard Frog and Wood Turtle are species of concern in proximity of the project area and a copy of the NHB is attached to this application. A reported in the NHB, the silver maple is a concern for the natural community and the Sessile-fruited Arrowhead is an endangered plant species.

We have discussed the proposed design with Kim Tuttle of NH Fish and Game and the proposed slip lining of the 36" culvert with a smooth interior was acceptable.

We also discussed the replacement culvert types of plastic or steel with a smooth interior or polymer coated corrugated metal pipe. The Fish and Game Department recommends that a roughened texture such as a concrete pipe or a roughened coating that covers the bottom half of the pipe be provided for the 48" and 54" replacement culverts. The proposed design is intended to provide a pipe or coating having a rough texture consistent with the F & G requirements. A copy of the e-mail correspondence with NH Fish and Game is included with this application.

8. The impact of the proposed project on public commerce, navigation and recreation.

The entire project is intended to maintain the greater public use and public commerce of I-393 with the necessary maintenance and replacement of the failing culverts when completed. The proposed culvert replacement will also maintain and retain continued access to local recreation areas and should have a positive impact to overall general public upon completion. No impacts to navigation are expected upon completion of the project.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

No permanent impacts are anticipated upon completion. The project is necessary to perform maintenance of the existing highway infrastructure. Temporary aesthetic impacts will occur during construction with the construction of the access drives and clearing to access the culverts adjacent to the I-393 that will be visible. Upon completion the roadway and embankments will be restored. The existing culverts are not visible to motorists and it is anticipated the replacement culverts will also not be visible. The culverts are not visible to current abutters and are not located along a lake.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

No permanent impacts are anticipated upon completion. This project is intended to provide necessary maintenance of existing infrastructure to maintain the public rights of passage along I-393. Some temporary impacts or inconveniences could occur during construction along I-393, until completion of the project, since the construction traffic to the culverts would access from I-393 as indicated on the attached plans.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

The State is the abutting property owner for the 54" and 48" culvert and for the outlet of the 36" culvert and the anticipated effect is an improvement to the current drainage infrastructure upon completion. The abutting owner at the upstream 36" culvert end would see an improvement during flooding events with the maintenance improvements to the culvert inlet and placement of stone fill at the inlet to allow the more efficient discharge of runoff from the existing wetland than currently exists due vegetation overgrowth.

12. The benefit of a project to the health, safety, and well being of the general public.

The project addresses a concern of the NHDOT relative to the deteriorated CMP culverts located under I-393 that pose a risk to the public/motorists with culvert failure and for emergency services for this area. The existing CMPs culvert are deteriorated and could fail at any time or upon a large flood event that would impact the health, safety and well-being of the general public that use I-393. The proposed maintenance work to install two new culverts to replace two failing existing culverts and slip line an existing 36" culvert is intended to maintain the current access along I-393 used by the general public. Upon completion, the project will benefit the health, safety and well-being of the public by providing a safer public access through this location along I-393.

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

The impacts associated with this project are primarily temporary construction impacts for the culvert replacement, erosion stone aprons, temporary water diversion and associated access drives. Under the project the size of the existing culverts to be replaced will be retained with the intent to restore the amount of water entering the site and exiting the site that has been reduced by the culvert partial collapse. As part of the proposed culvert replacement, stone fill aprons at the inlet and outlet will be installed for water quality measures, where possible that currently do not exist, which is intended to upgrade the water quality in the area. The existing drainage patterns will be maintained. The requirements of the project include erosion control measures as indicated in the drawing details and that no degradation of water quality is to occur.

For the 36" pipe slipline, the proposed sliplining is anticipated to be a thin walled cured in place liner. It is anticipated the 36" culvert sliplining would have an insignificant impact to the pipe capacity to convey water from the site. Stone fill aprons similar to the above culverts would be installed to upgrade the water quality.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

The project design intent is to maintain the current hydraulic capacity and conductivity and thus is not intended to increase flooding, erosion or sedimentation. Proposed fill in the 100-year flood plain under this project is compensated/mitigated in the same location (upstream end of 54" culvert) under this design. As part of the project design, both of the proposed new culvert inlet and outlet locations will require excavation of the existing ground and involve excavation for channels to connect the existing wetlands to maintain the current hydrology. The additional excavation will provide some additional flood volume/capacity in the 100-year floodplain at the lower elevations of the culvert inlets and outlets, but the additional volume is insignificant in the overall floodplain. The erosion stone aprons for the proposed culverts are designed in accordance with NHDES requirements to minimize erosion to the upstream and downstream areas to the extent practical and minimize the wetland impacts. All disturbed areas will be re-established with permanent cover types, such as grass or erosion stone, to reduce sedimentation potential. Construction will utilize standard erosion and sedimentation control measures as indicated in the drawings and specifications.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

The project proposes to relocate and replace two culverts and upgrade one culvert under the highway that connect existing wetland areas. We would anticipate that the impacts related to current or wave energy would not change from those that currently exist and does not appear applicable under this project and are not anticipated. Please note that erosion stone aprons are installed at the new culvert inlets and outlets and at the sliplined culvert that are intended to minimize current and wave energy during storm events and minimize impacts to the wetlands.

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

Insignificant impact. The majority of the proposed impacts are fringe impacts associated with the replacement or repair of the culverts under the existing highway, installation of erosion aprons, and minor reconstruction of the existing swale from the State Office Park. The temporarily impacted areas will be restored upon completion of the project. The permanent impact areas will maintain the existing drainage patterns between the wetlands areas. It is our understanding that the area along the southerly portion of the site is owned by the State and has been mostly developed for the State offices and it is unlikely that any further significant development would occur. The northerly portion is primarily located in a flood prone area and thus, significant development in this area is unlikely and would not propose significant impacts to the wetland complex. Any further development in this area would be unlikely and would not have any measurable impact to the wetland affected by the permanent fill under this project.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The proposed impacts are associated with relocation and construction of two new culverts to replace two failed culverts and a slipline repair to one existing culvert, installation of erosion stone aprons, temporary access and construction areas and temporary erosion control measures. The temporary impacted areas will be restored to their original elevations where practical upon completion of the project. The vegetative values of the disturbed wetlands are preserved by saving and reusing the loam and organic material from the wetlands to re-establish the wetlands outside the permanent impact areas upon completion of construction. Under the project, the two new match size culverts will be installed at the same elevations as the existing failing culverts to maintain the same functions and values to the wetlands. The proposed design is intended to maintain the existing hydraulic conductivity to the culverts between the north and south sides of the highway.

The proposed sliplining of the 36" culvert will retain the existing functions and values of the wetland and will have an insignificant impact on the amount of water that can flow from one wetland area to the other.

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

None known. File research has been conducted at the New Hampshire Department of Historical Resources (NHDHR) relative to the historic resources and a copy is attached. In addition, the project was reviewed for cultural resources and the Effect Review Memo for the project is included with the application.

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

Not applicable. There are no known national rivers, wilderness areas or such areas within the project limits or in close proximity to the project.

20. The degree to which a project redirects water from one watershed to another.

No impact. The project does not redirect water from one watershed to another.

Additional comments

Additional supporting information includes several slides from the project presentation at NHDOT Natural Resources meeting conducted on September 16, 2015.

Stantec

Construction Sequence

Reference: **NHDOT Projects: Concord 16287 / 16288**

The following documents the anticipated general construction sequence for the installation of a 54" and 48" culvert and the slip lining of an existing 36" culvert under Interstate 393 in Concord, NH. It is assumed both construction access ramps will be constructed prior to the replacement of either the 54" or the 48" culvert. It is also assumed the construction access ramps will remain in place for the duration of construction and will remain in place upon completion of the projects.

Notes:

- The culvert replacement shall be done during low flow periods.
- The Erosion Control Plan provides a typical construction dewatering and flow control plan. The Contractor shall submit drawings and details showing materials to be used, proposed method of construction, and other details left open to the choice of the Contractor or not fully shown on the plans.

Construction Access for all projects

1. Install traffic control
2. Install erosion and perimeter controls at all locations where necessary and as indicated on the Erosion Control Plans.
3. Construct the access ramps from Interstate 393 and provide for temporary access routes and staging areas required for each project.
4. Provide temporary slope stabilization.

54" and 48" Culvert Replacement Sequence

1. Install a 24" temporary water diversion pipe and necessary cofferdams as indicated on the Erosion Control Plans.
2. Construct dewatering discharge filtering basins.
3. The contractor shall provide sumps and well points with temporary pumping as required to construct / install the headwalls for the new culvert. The contractor shall pump to sediment control basins, sediment bags, or similar measures during the dewatering operations.
4. Construct the temporary jacking slab, reaction slab, and bulk head required for the jacking operations.
5. Install the proposed culvert under the roadway embankment using an approved trenchless technology and remove the soil from the inside of the culvert and remove it from the site.
6. Remove the jacking slab, reaction slab, and bulk head.
7. Construct the upstream and downstream headwalls.
8. Regrade the inlet and outlet locations per the construction plans.
9. Construct the stone lined swale and stone aprons at both the inlet and outlet locations.
10. Remove any temporary cofferdams used for flow control.
11. Remove the temporary water diversion pipe.
12. Direct flow through the new culvert.
13. Bulkhead the existing outlet and retain the existing headwall.
14. Pump flowable fill into the existing corrugated metal pipe culvert and bulkhead the inlet.

Reference: NHDOT Projects: Concord 16287 / 16288

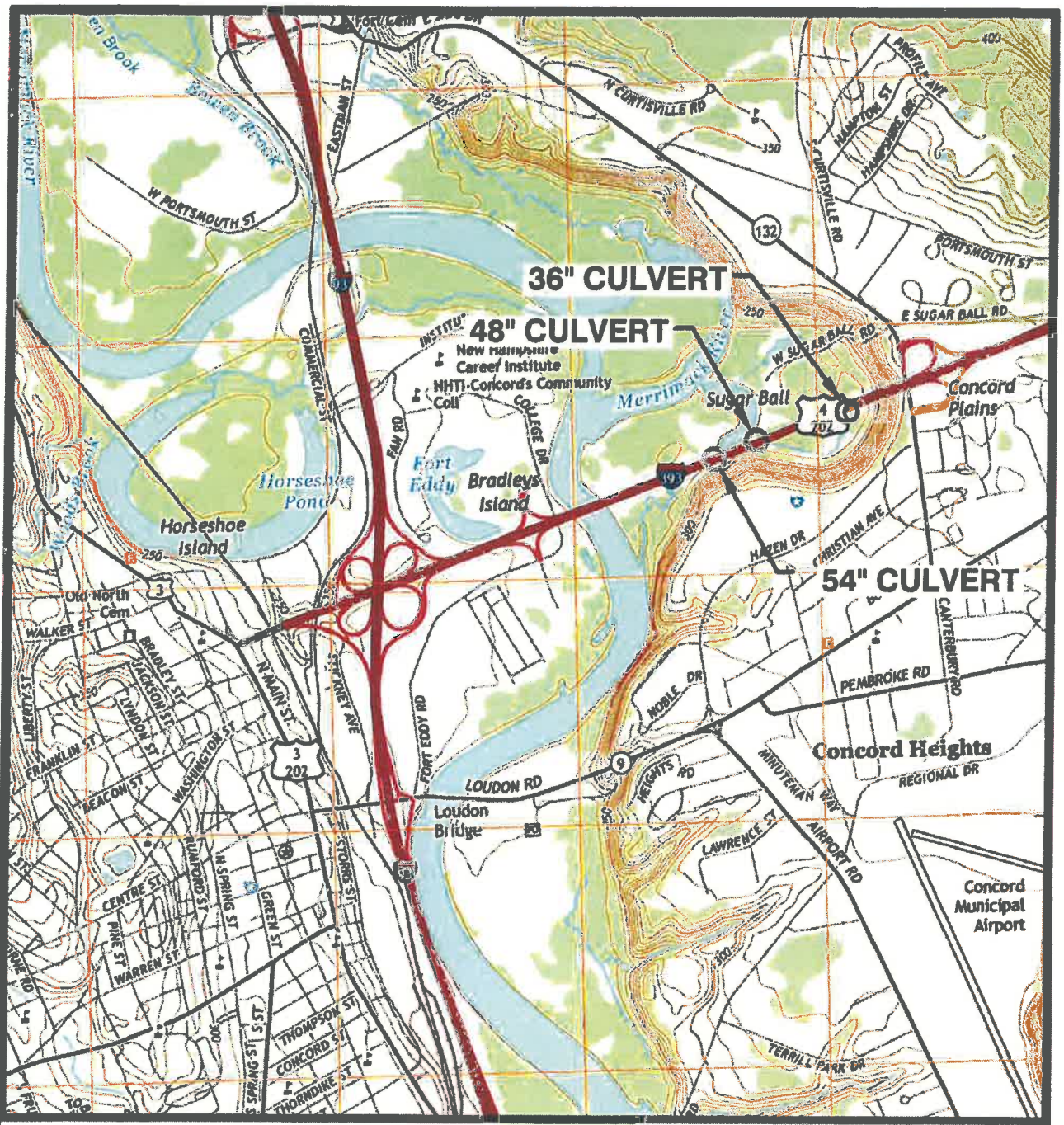
15. Remove erosion and sediment controls at the inlet and outlet locations.

36" Culvert Rehabilitation Sequence

1. Install sand bag cofferdam at the inlet and outlet locations.
2. Provide temporary flow control by pumping water to dewatering discharge filtering basins.
3. Remove inlet and outlet headwalls at the 36" Corrugated Metal Pipe (CMP).
4. Slip line the existing culvert.
5. Reconstruct both the inlet and outlet headwalls.
6. Construct stone aprons at the inlet and outlet locations.
7. Remove the erosion and perimeter controls at the inlet and outlet.

Project Completion

1. Re-establish vegetation including all temporarily disturbed wetlands.
2. Remove all temporary access routes and staging areas required for each project. Grade staging areas as indicated on the construction plans.
3. Establish vegetation on the construction access ramps which are to remain in place.
4. Remove all remaining erosion and perimeter controls and revegetate.
5. Re-establish vegetation on highway embankment slopes.



MAP SOURCE:
WWW.USGS.GOV
CONCORD QUDRANGLE, 2015
NEW HAMPSHIRE–MERRIMACK CO.

NEW HAMPSHIRE

0 2000 4000
Scale in feet

ORIGINAL SHEET - ANSI A

OCTOBER, 2015
1951131112 / 1951113113

V:\1917\temporary\Andrew\Projects\I-393 Culverts Concord, NH\Geotech Report Figures.dwg

Stantec

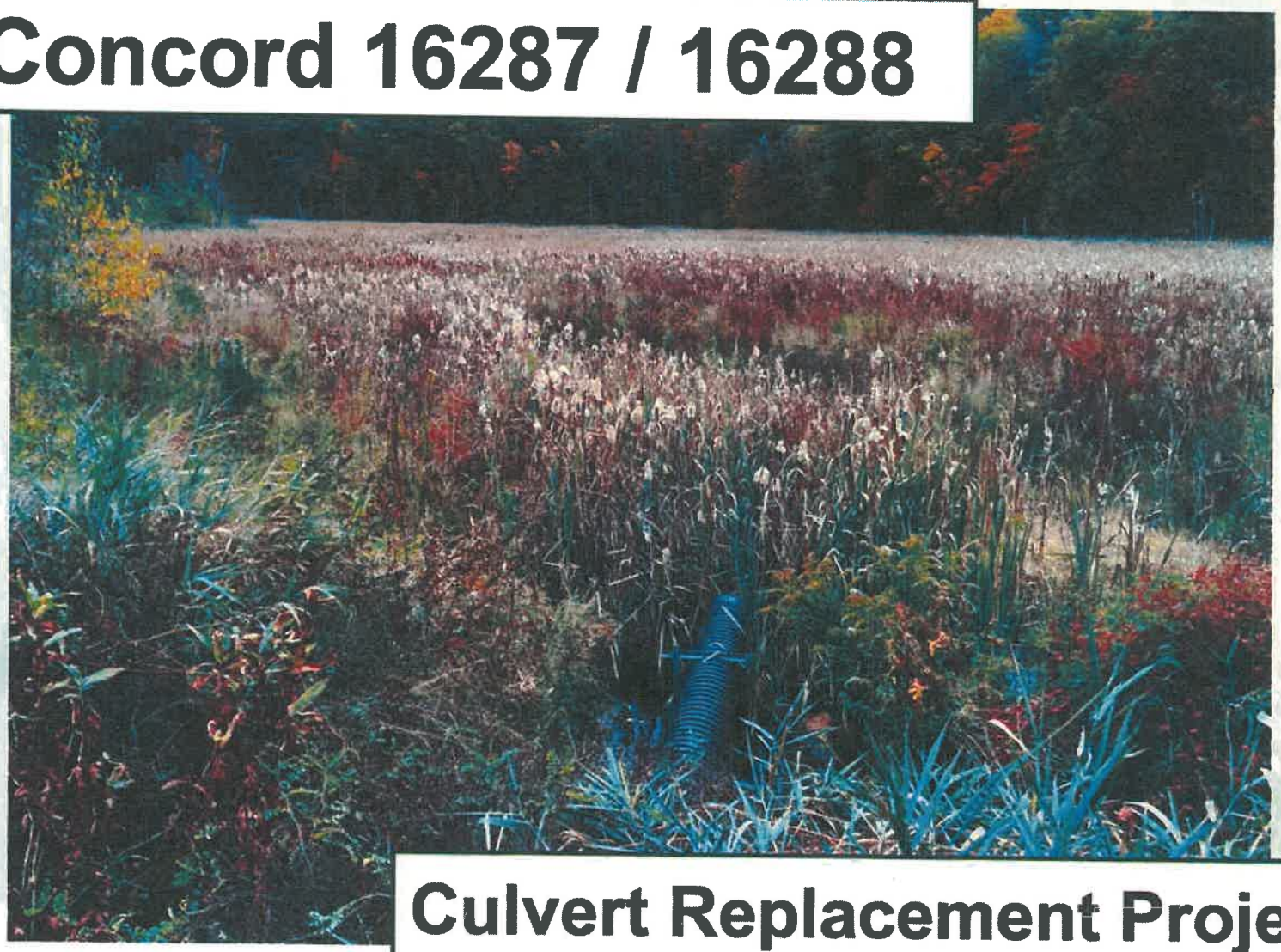
Stantec Consulting Services Inc.
5 Dartmouth Dr, Suite 101
Auburn NH 03032 U.S.A.
Tel. 603.669.8672

Client/Project
NH DEPARTMENT OF TRANSPORTATION
I-393 CULVERT REPLACEMENT PROJECT
CONCORD, NH

Figure No.
1.0

Title
SITE LOCATION PLAN

Concord 16287 / 16288



Culvert Replacement Project

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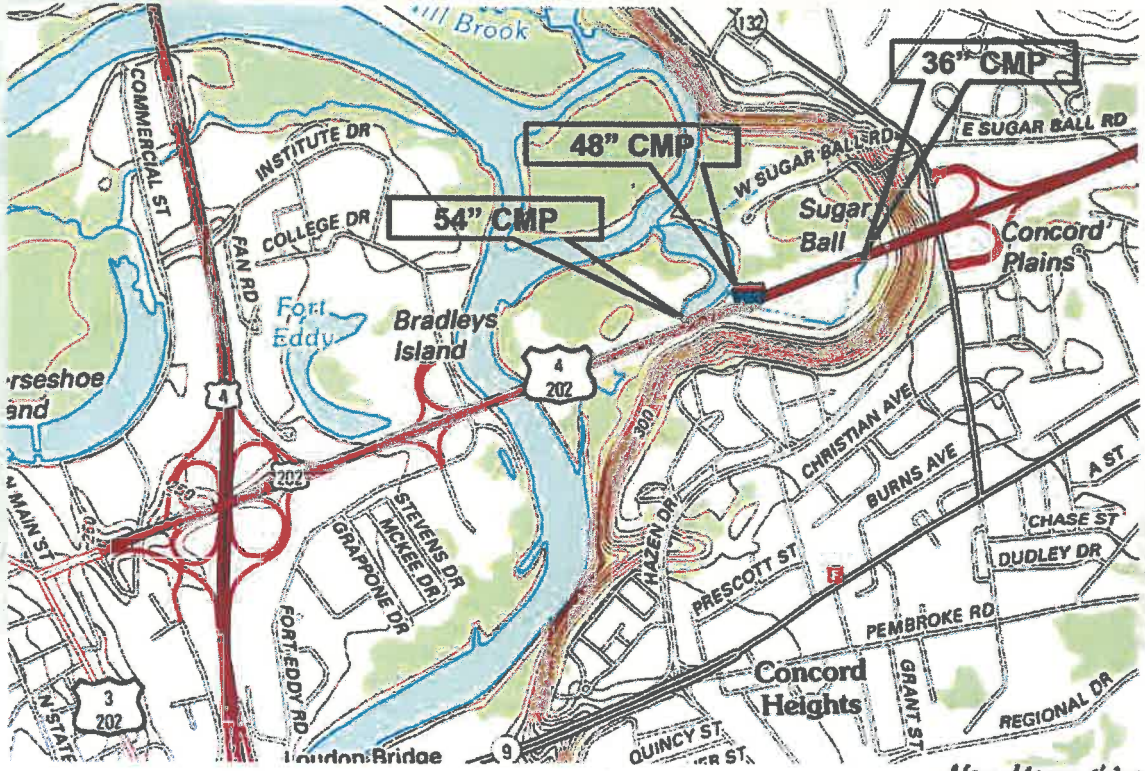
New Hampshire DOT
Department of Transportation

Project Location

- West of Exit 2 on Interstate 393
- Drains to Sugar Ball then to Merrimack River
- Existing Deteriorated Corrugated Metal Pipe (CMP) culverts constructed in 1978
- Lane Configuration-
  - Divided Highway with Concrete Median Barrier
  - 2 - 12' Travel Lanes per barrel
  - 10' Shoulder
- 21,000 AADT (2014)



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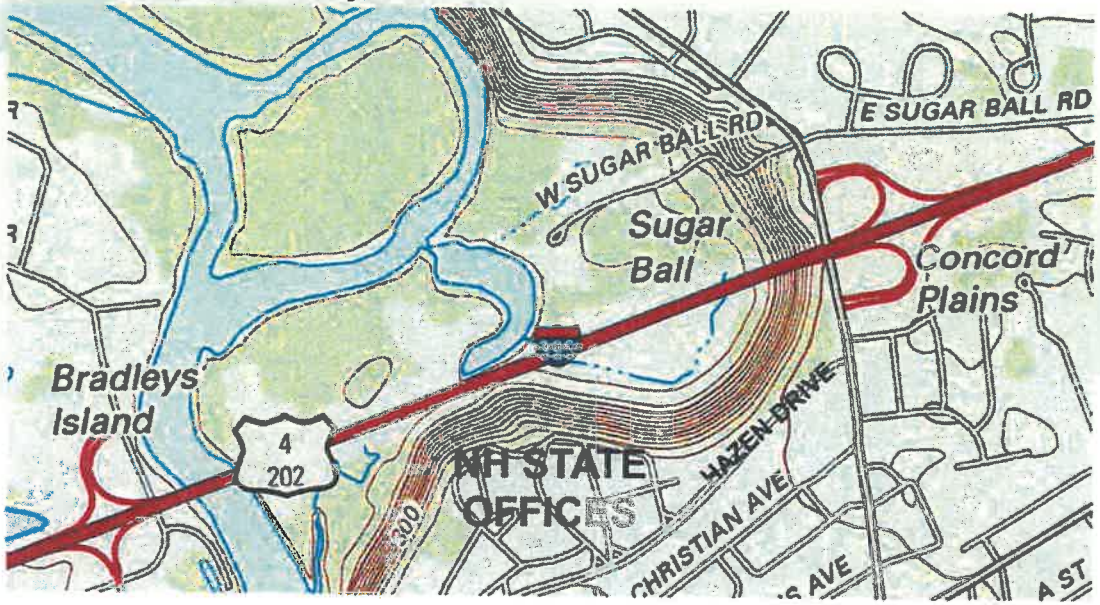
New Hampshire DOT
Department of Transportation

Watershed

- The culverts are not located on water courses, Per NHDOT Summary of Initial Environmental Review
- No evidence of a scoured channel at any location, Per NHDOT Summary of Initial Environmental Review
- All three culverts (36", 48", and 54" CMP culverts) appear to function as equalizer pipes.
- The watershed is highly developed and includes portions of Interstate 393 and the Hazen Drive State Office Complex



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New Hampshire DOT Department of Transportation

NH Wildlife

- Species of Concern within the project limits are as follows:
  - Bald Eagle - Threatened
  - Blanding's Turtle - Endangered
  - Northern Leopard Frog – Special Concern
  - Wood Turtle – Special Concern

- Northern Long-Eared Bats (NLEB) are not a concern for the clearing limits – Formal documentation indicates these projects will have "No Effect" on the NLEB population

Note: Preliminary coordination with New Hampshire Fish and Game has occurred for the above referenced wildlife.

Site Area – 36" Culvert

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INLET (NORTH SIDE)

OUTLET (SOUTH SIDE)

New Hampshire DOT Department of Transportation

Site Area – 48" Culvert

Stantec

INLET (SOUTH SIDE)

OUTLET (NORTH SIDE)

New Hampshire DOT Department of Transportation

Site Area – 54" Culvert

Stantec

INLET (SOUTH SIDE)

OUTLET (NORTH SIDE)

New Hampshire DOT
Department of Transportation

Project Need – 36" CMP

- Culvert is in acceptable condition and continues to function as designed
- Remedial measures are required
- Recommendation: Slipline the existing CMP culvert to minimize impacts
- Construct new Headwalls at the inlet and outlet.
- NHF&G indicated a smooth lined pipe is acceptable for the project.

Culvert Inlet

Culvert Outlet

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New Hampshire DOT Department of Transportation

Project Need – 48" CMP

- Experiencing structural failure in numerous locations
  - Loss of invert
  - Loss of sidewalls
  - Severe Material Corrosion
- Headwall in poor condition
- Slope failure immediately above upstream headwall.
- Beaver activity has been reported by NHDOT.

Culvert Inlet

Culvert Outlet

Stantec

New Hampshire DOT Department of Transportation

Project Need – 54" CMP

- Experiencing structural failure in numerous locations
  - Loss of invert
  - Loss of sidewalls
  - Severe culvert material deterioration
- Headwall in poor condition
- Sink hole in close proximity to the downstream end section.
- NHDES facility contributes storm water directly to culvert inlet.

Culvert Inlet

Culvert Outlet

Stantec

New Hampshire DOT Department of Transportation

Design Considerations

- Maintain existing drainage flow
- Minimize environmental impacts
- Minimize impacts to the public / motorists
- Providing for future maintenance access to the culverts.

- Various trenchless technologies that were considered:
  - Slip lining
  - Micro tunneling
  - Pipe ramming
  - Pipe jack and bore

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New Hampshire DOT Department of Transportation

Alternatives Considered But Not Feasible: 48" and 54" Culverts

- Open excavation – Not feasible due to depth of excavation and traffic volumes
- Rehabilitation by Slip Lining methods for the existing 48 and 54" CMP culverts is not feasible due to:
  - Loss of Pipe Invert
  - Severe deformation of existing culvert
    - Crimping sidewalls
    - Missing crown in multiple locations
  - Culvert vertical misalignment (Sag)
- Pipe Ramming
  - Causes vibration in soil and to adjacent infrastructure
  - May worsen existing sinkholes

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Preferred Alternative- Pipe Jack and Bore or Micro Tunneling

Preferred design based on:

- Minimizes environmental impacts
- Similar impacts regardless of the chosen method
- Lower cost (compared to open excavation)
- Constructability

Design Notes:

- Temporary access road to remain in place for maintenance access
- All surfaces are to have turf establishment with mulch and humus including the access ramps
- The new 48" and 54" culverts will have a roughened surface along invert

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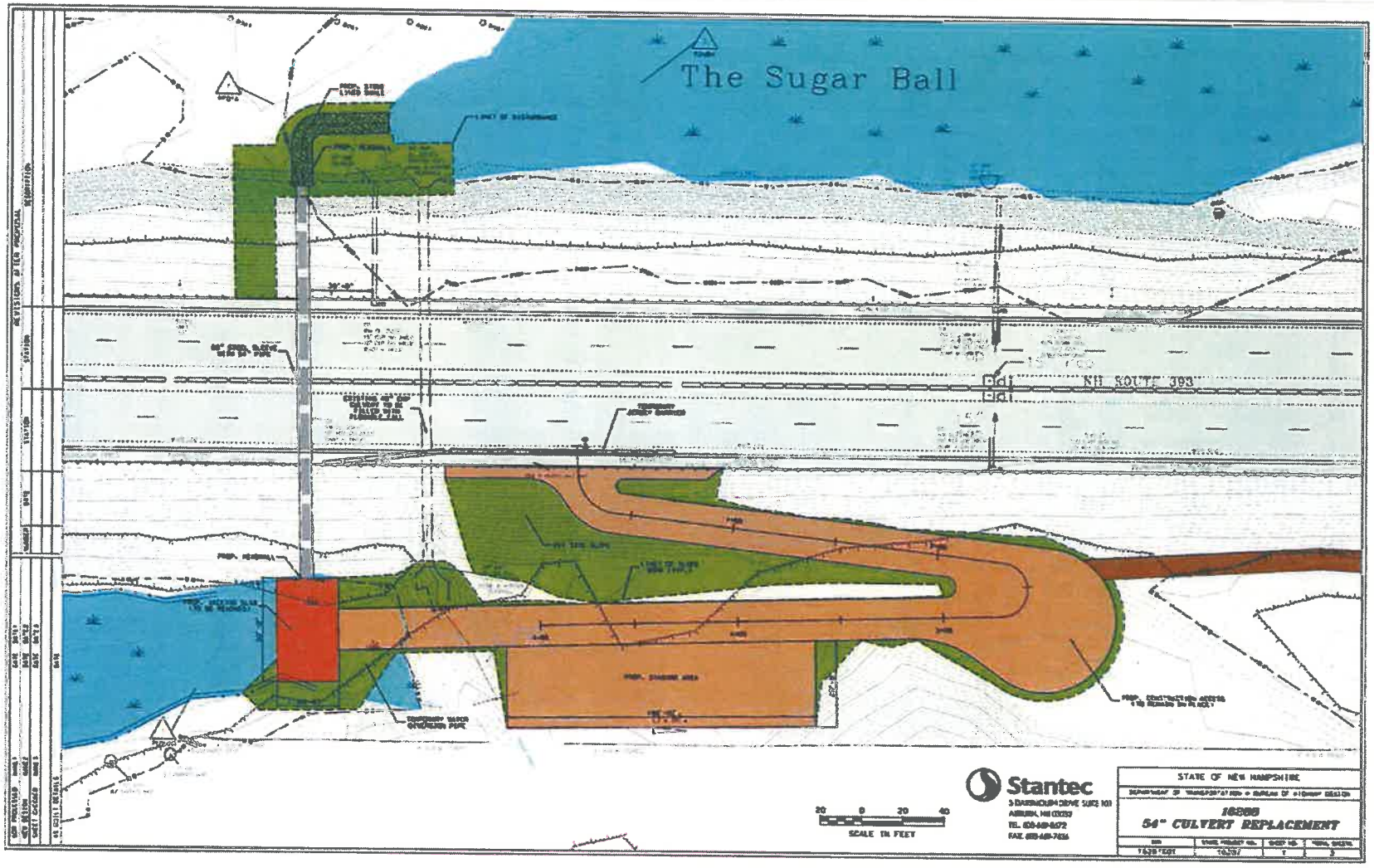
New Hampshire DOT Department of Transportation

54" CULVERT REPLACEMENT ACCESS



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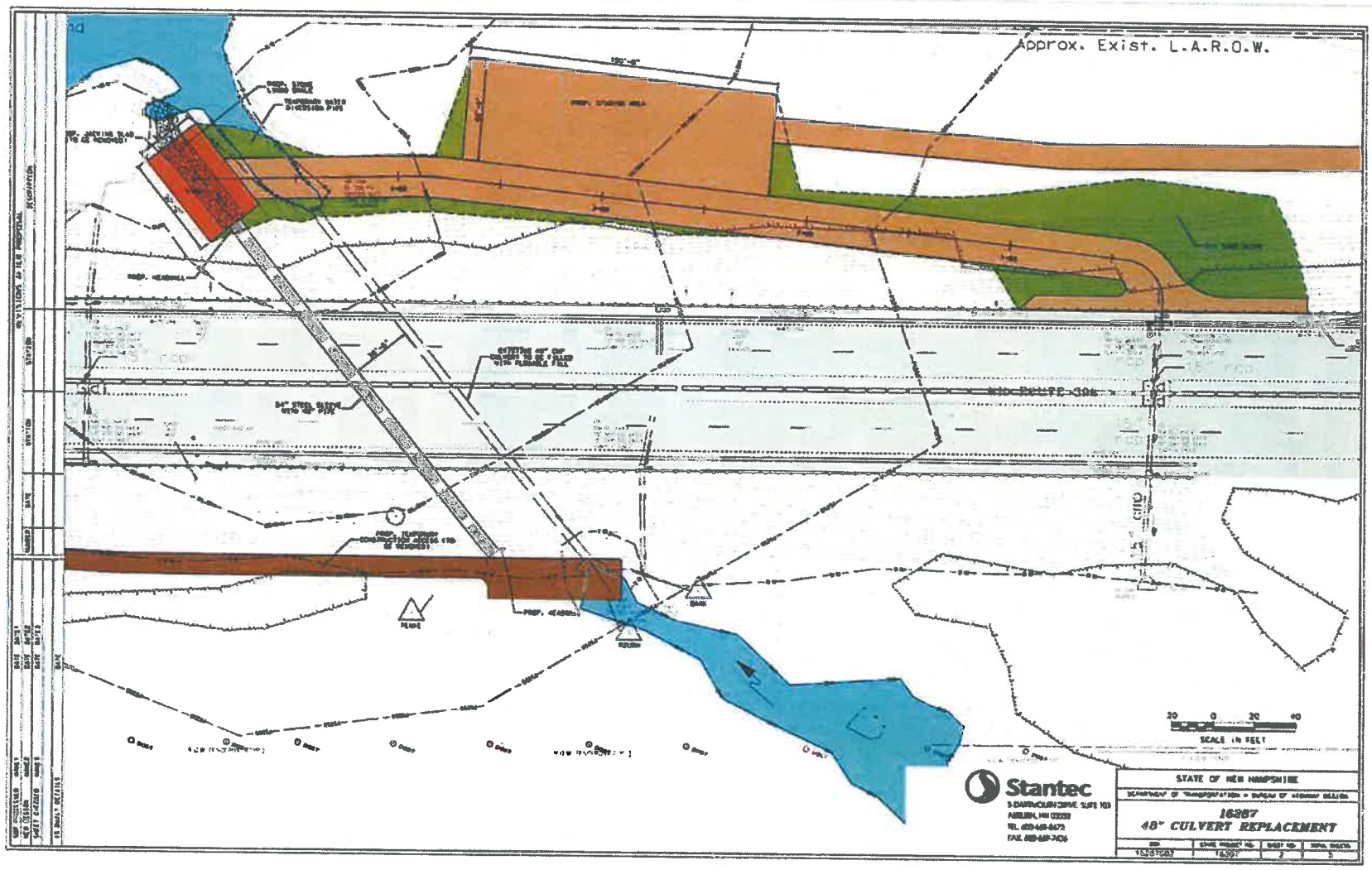
Department of Transportation

48" CULVERT REPLACEMENT ACCESS



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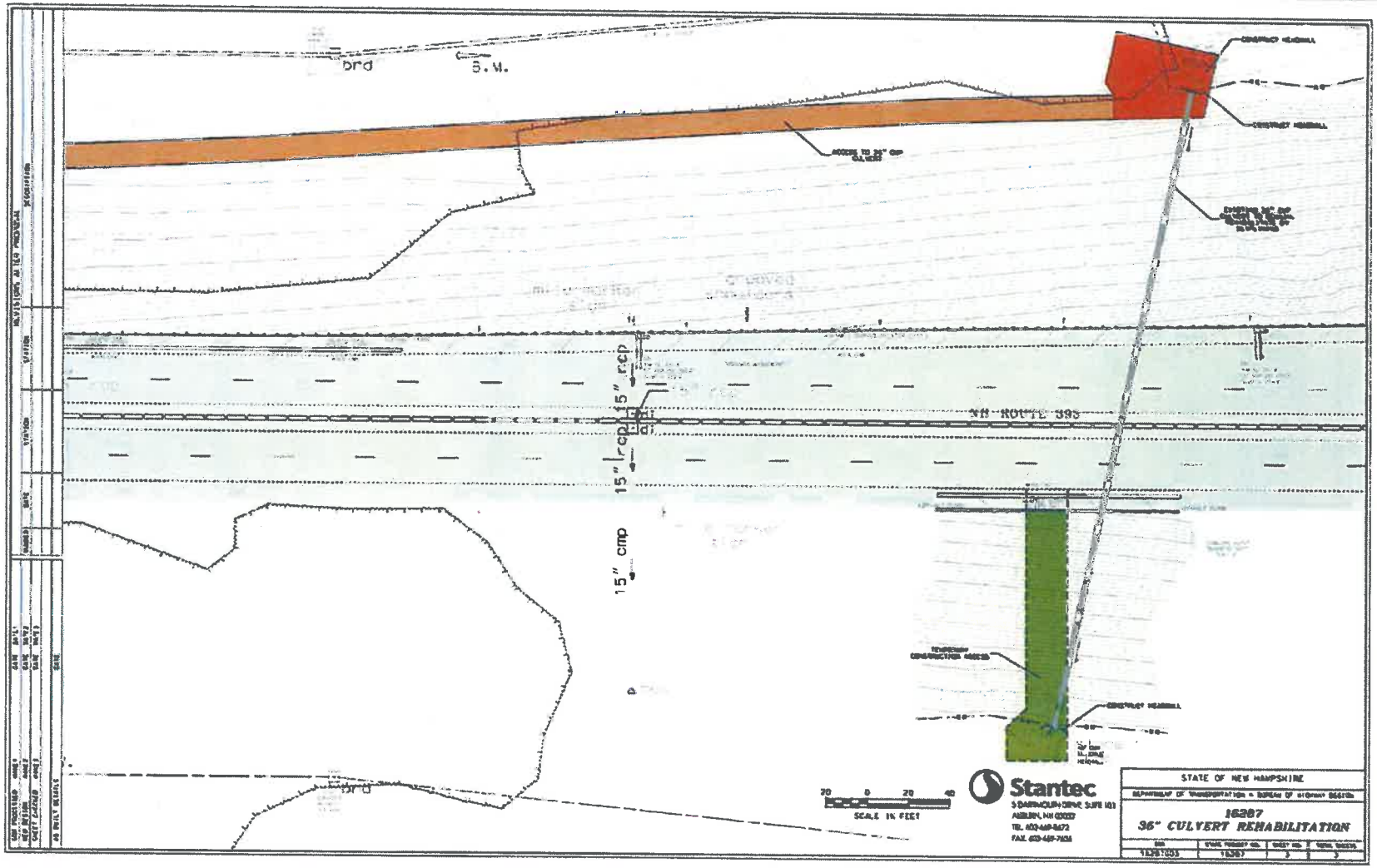
New Hampshire DOT
Department of Transportation

36” CULVERT REPLACEMENT ACCESS



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New Hampshire DOT Department of Transportation

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#1 at Impact A - Standing near centerline station 6+00 of the temporary access drive and looking northwesterly at the edge of the wetland and temporary impact area. The existing 54" culvert inlet is seen at the right edge. Taken 9/10/14

#2 at Impact A - Standing along the proposed stone lines swale near station 6+25 RT and looking westerly along the temporary impact area and proposed jacking slab location to install new culvert. Taken 9/10/15

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
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#3 at Impact A - Standing along the proposed stone lines swale near station 6+25 RT and looking southerly along the proposed temporary impact area for the proposed access drive. Taken 9/10/15

#4 at Impact A - Standing within the wetland area and just westerly of the proposed temporary impact area limits and looking easterly toward the existing 54" culvert headwall area and proposed impact area B taken 9/10/15.

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#5 at Impact B - Standing within the wetlands near sta. 6+00+/- and looking northerly at the existing 54" culvert headwall and inlet and proposed impact area. Taken 9/10/15

#6 at Impact B - Standing within the wetland and proposed impact area and looking at the existing 54" culvert headwall inlet and partial collapse within the culvert. Taken 9/10/15

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#7 at Impact C & D - Standing near the proposed stone line swale outlet area and looking south westerly toward the existing 54" culvert headwall and outlet and proposed impacts. Taken 9/10/15

#8 at Impact C and D - Standing easterly of the proposed impact limits and looking westerly at the existing 54" culvert and the proposed impact areas to the wetlands and bank and proposed stone lined swale area from the new culvert. Taken 9/10/15

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#9 at Impacts C &D - Standing within the wetlands and westerly of the proposed impacts and looking easterly toward the proposed impacts and existing 54" culvert outlet area. Taken 9/10/15

#10 at Impacts C & D - Standing at the top of bank northerly of the impact areas and looking southerly toward the proposed impact areas for the new culvert headwall, stone lined swale and existing 54" culvert headwall outlet to be plugged. Taken 9/10/15

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#20 at Impact E & I- Standing near northerly side of the temporary access drive near station 5+25 and looking southeasterly at the existing 48" culvert outlet area and embankments and proposed impact areas. Taken 9/10/15

#21 at Impact E & I - Standing near southerly side of the temporary access drive near station 5+10 and looking southeasterly at the existing 48" culvert outlet area and embankments and proposed impact areas. Taken 9/10/15

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
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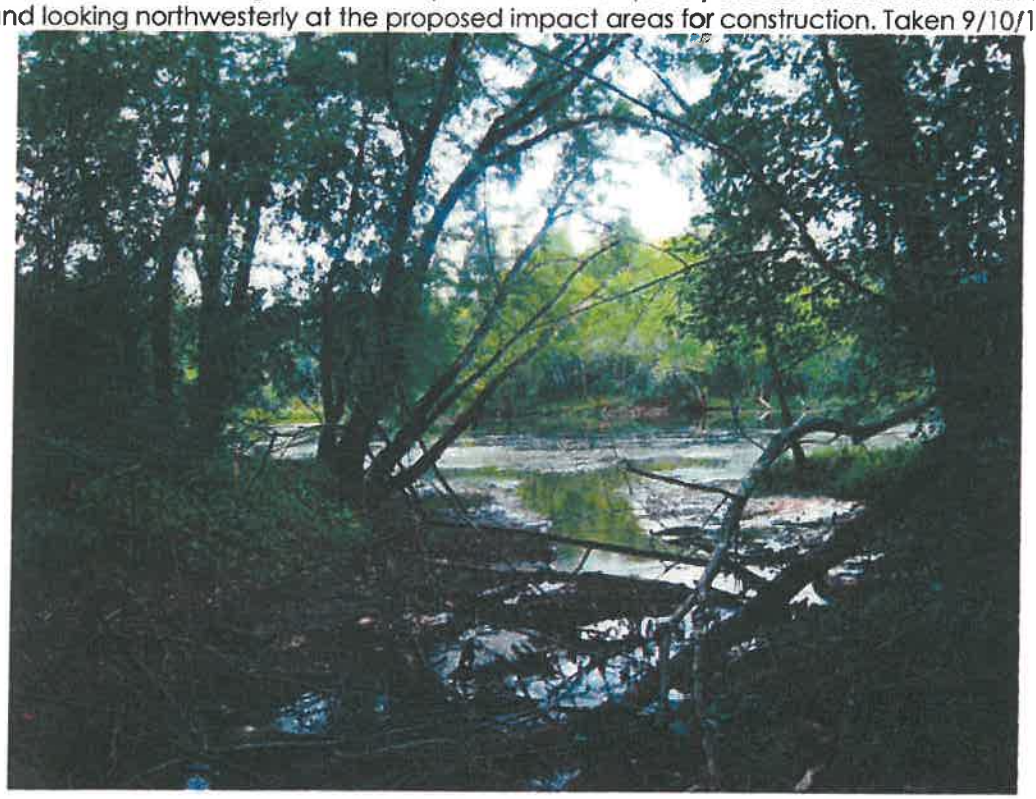
Agent: Stantec Consulting Services, Inc.

#22 at Impacts E & I - Standing near southerly side of the temporary access drive near station 5+10+/- and looking northwesterly at the proposed impact areas for construction. Taken 9/10/15

#23 Impacts E & I - Standing near northerly side of the temporary access drive near station 5+25+/- and looking northwesterly at the proposed impact areas for construction. Taken 9/10/15.



Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

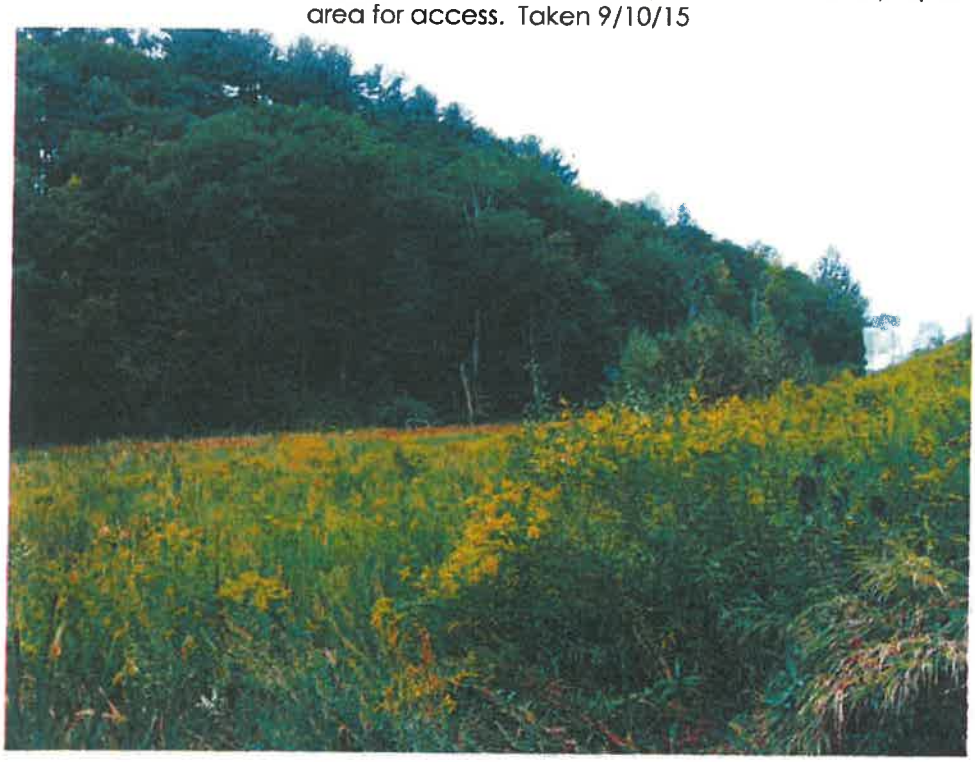
#24 at Impact F - Standing within the wetlands and south of the existing 48" culvert inlet and looking northwesterly at the existing culvert headwall and inlet and proposed temporary impact area. Taken 9/10/15

#25 at Impact F - Standing on the 48" headwall and looking southeasterly at the proposed temporary impact area. Taken 9/10/15

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

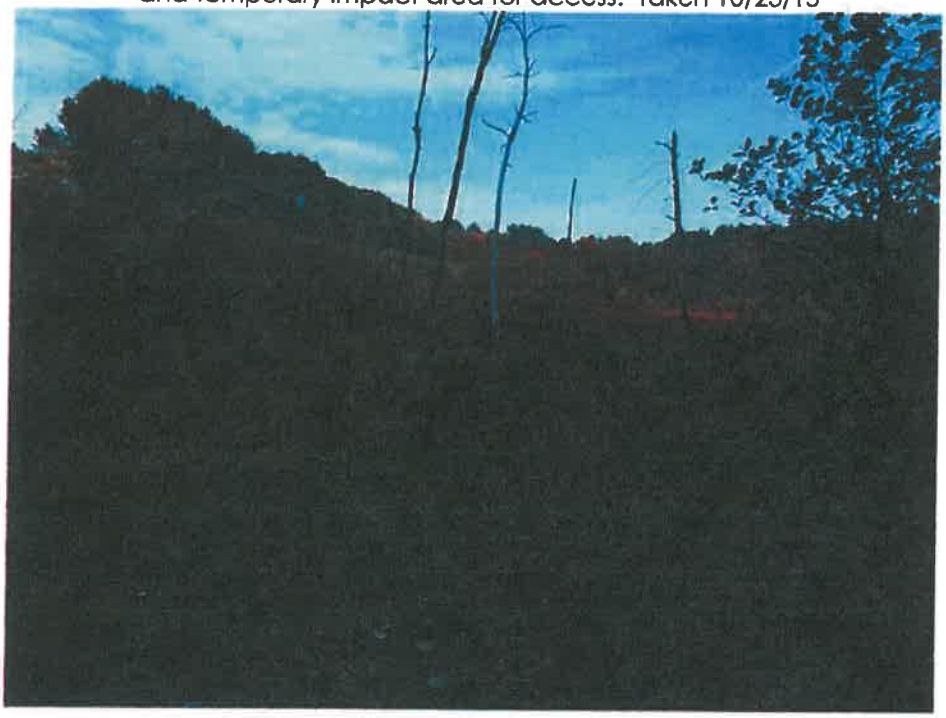
#26 at Impact F - Standing near the center of the proposed swale to be constructed to the new culvert near station 3+00 and looking northerly at the existing culvert headwall and proposed temporary impact area. Taken 9/10/15

#27 at Impact F - Standing near the center of the proposed swale to be constructed to the new culvert near station 3+00 and looking northeasterly at the proposed culvert and proposed impact area for access. Taken 9/10/15

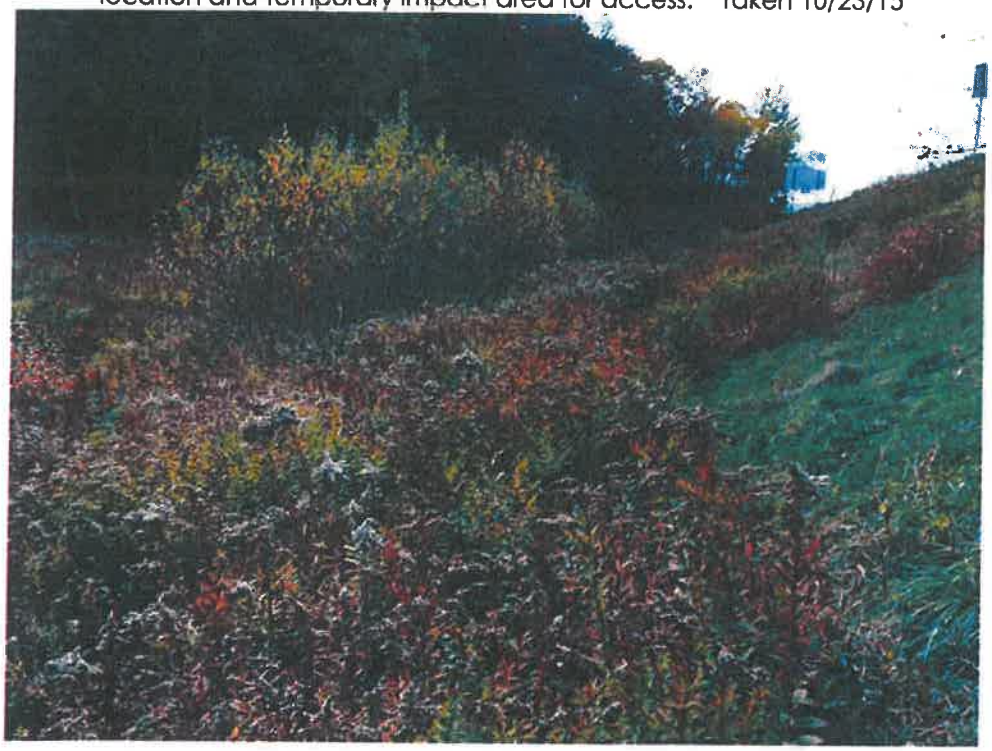


Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#28 at Impact F - Standing near the center of the southerly proposed temporary construction access drive near I-393 station 81 and looking easterly along the proposed access drive location and temporary impact area for access. Taken 10/23/15

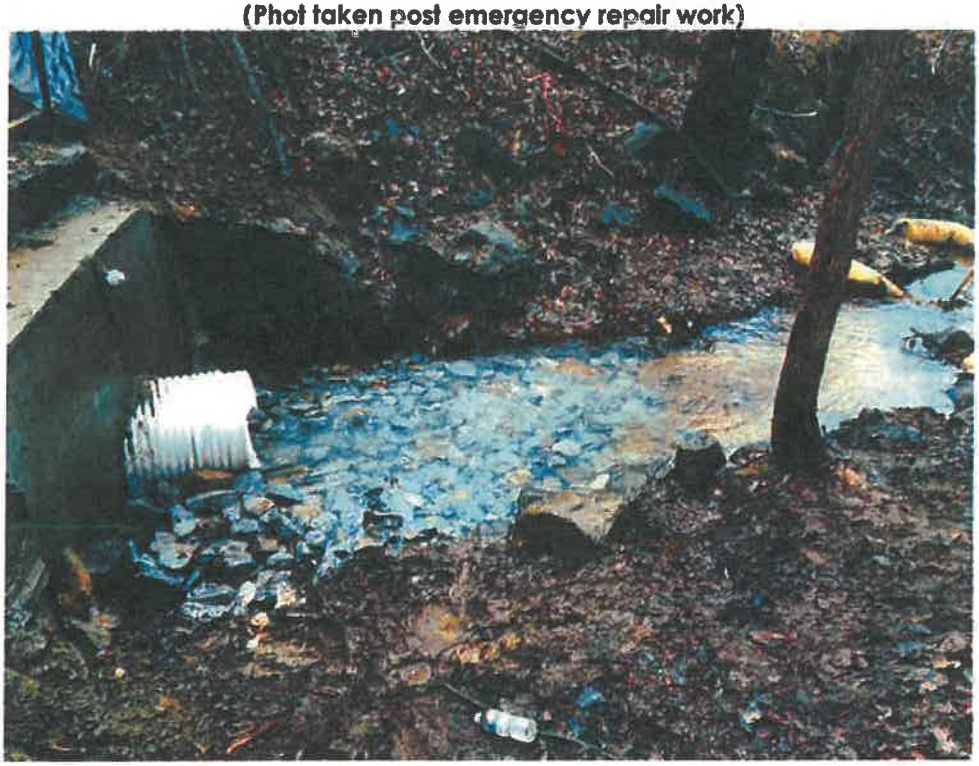


#29 at Impact F - Standing near the center of the southerly proposed temporary construction access drive near I-393 station 83+50 and looking westerly along the proposed access drive location and temporary impact area for access. Taken 10/23/15

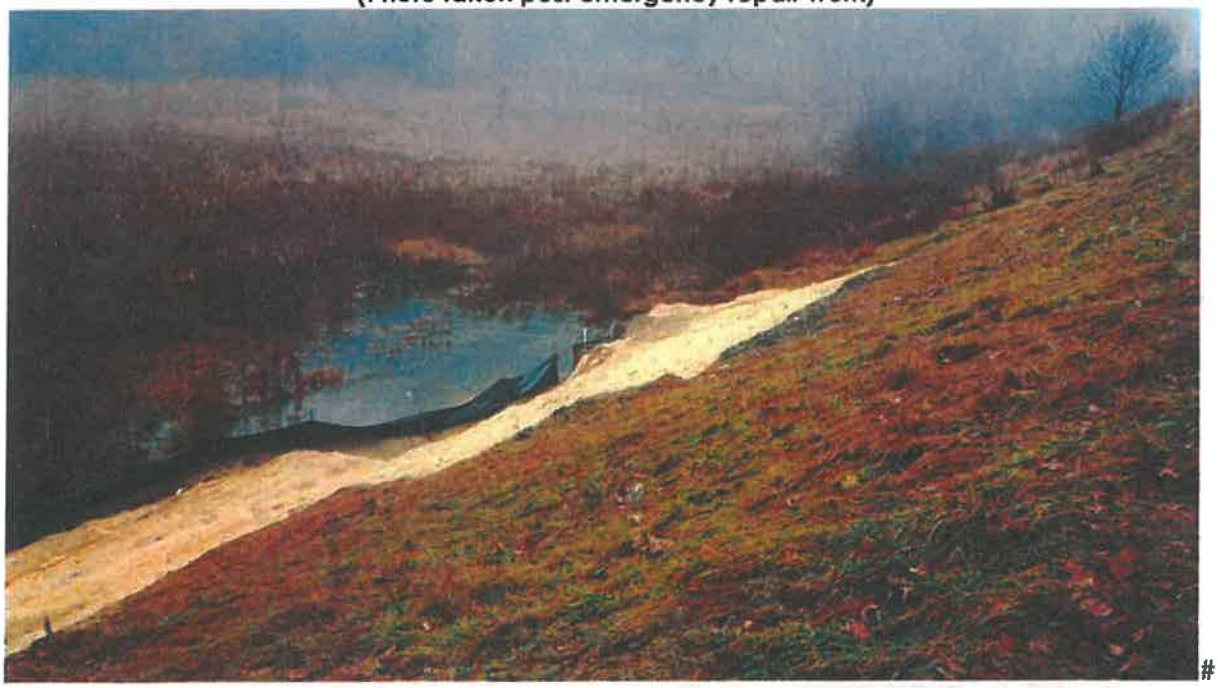


Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#29A at Impact E & I - Standing near the existing culvert outlet that has been sliplined as part of the emergency repair work. Taken 12/09/15
(Phot taken post emergency repair work)



#29B at Impact F - Standing northerly of the newly sliplined 48" culvert. Taken 12/09/15
(Photo taken post emergency repair work)



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Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

29C at Impact F - Standing on top of the newly constructed headwall on the inlet side of the 48" culvert. Taken 12/09/15
(Photo taken post emergency repair work)

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#30 at Impact G- Standing near the top of the existing 36" outlet headwall and looking southerly at the proposed impact area for slip lining the existing culvert. Taken 9/10/15

#31 at Impact G - Standing near the easterly edge of the proposed impact and looking northerly at the existing headwall and 36" pipe outlet to be slip lined and proposed impact area. Taken 9/10/15

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

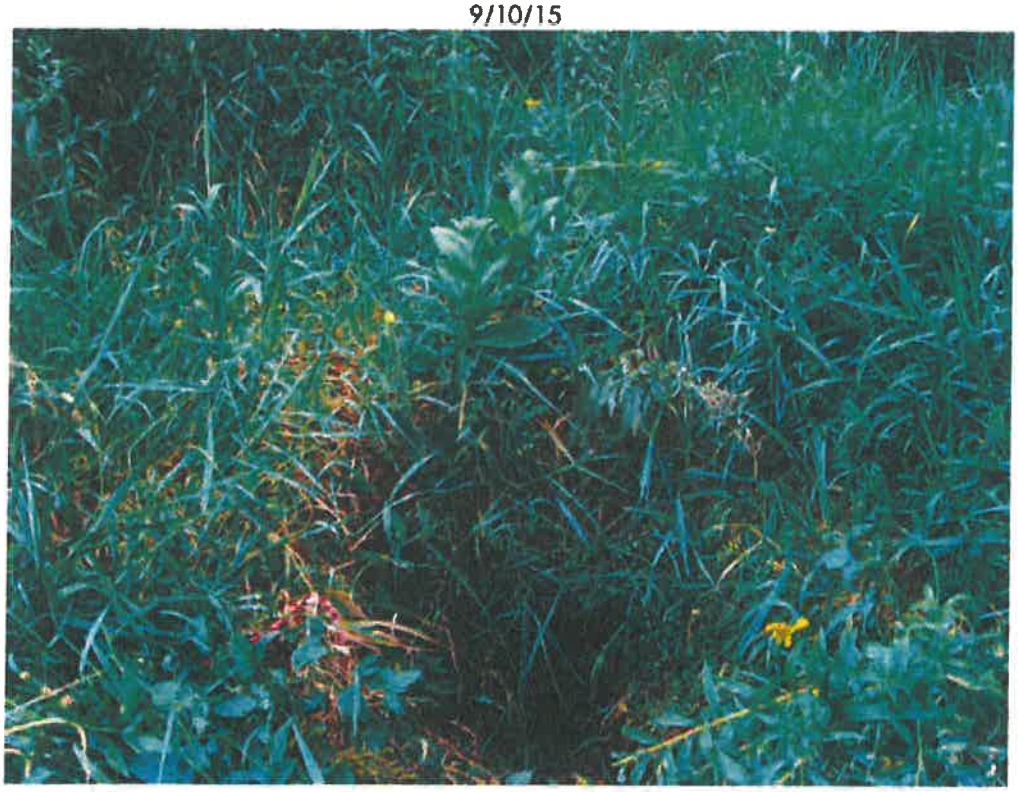
#32 at Impacts G - Standing southerly of and beyond the proposed impact area and looking northerly at the proposed impact area and 36" headwall outlet area. Taken 9/10/15

#33 Impacts H - Standing near easterly wetland edge and looking westerly toward the existing 36" culvert inlet and proposed impact area for the temporary access and slip lining work. Taken 9/10/15.

Infrastructure Improvements to Interstate 393
Between Exit 1 and 2 – Concord 16287/16288
Applicant: New Hampshire Department of Transportation
Agent: Stantec Consulting Services, Inc.

#34 at Impact H - Standing near the wetland corner and looking northerly at the proposed temporary impact area for the access drive to slip line the existing 36" culvert. Taken 9/10/15

#35 at Impact H - Standing within the wetlands and northeast of the existing 36" headwall and looking southwesterly at the existing headwall and proposed temporary impact area. Taken 9/10/15



Memo

NH NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

To: Michael Leach, Stantec Consulting Services, Inc.
5 Dartmouth Drive - Suite 101
Auburn, NH 03032

From: Amy Lamb, NH Natural Heritage Bureau
Date: 1/28/2016 (valid for one year from this date)
Re: Review by NH Natural Heritage Bureau
NHB File ID: NHB16-0230 Town: Concord Location: I-393 culverts repairs and replacement
Description: Culvert rehabilitation and replacement of 3 culverts under I-393 between Exits 1 and 2
cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: The project is located in a sensitive area; please send construction plans depicting the three culvert locations more precisely and detailing the proposed work. Please contact NH Fish & Game regarding wildlife concerns.

Natural Community	State[1]	Federal	Notes
Silver maple - false nettle - sensitive fern floodplain forest	--	--	Threats are primarily changes to the hydrology of the river, land conversion and fragmentation, introduction of invasive species, and increased input of nutrients and pollutants.

Plant species	State[1]	Federal	Notes
Sessile-fruited Arrowhead (*Sagittaria rigida*)*	E	--	Primarily vulnerable to changes to the hydrology of its habitat, especially alterations that change water levels. It may also be susceptible to increased pollutants and nutrients carried in stormwater runoff.

Vertebrate species	State[1]	Federal	Notes
Blanding's Turtle (*Emydoidea blandingii*)	E	--	Contact the NH Fish & Game Dept (see below).
Northern Leopard Frog (*Rana pipiens*)	SC	--	Contact the NH Fish & Game Dept (see below).
Smooth Green Snake (*Opheodrys vernalis*)	SC	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle (*Glyptemys insculpta*)	SC	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Rd.
Concord, NH 03301

Memo

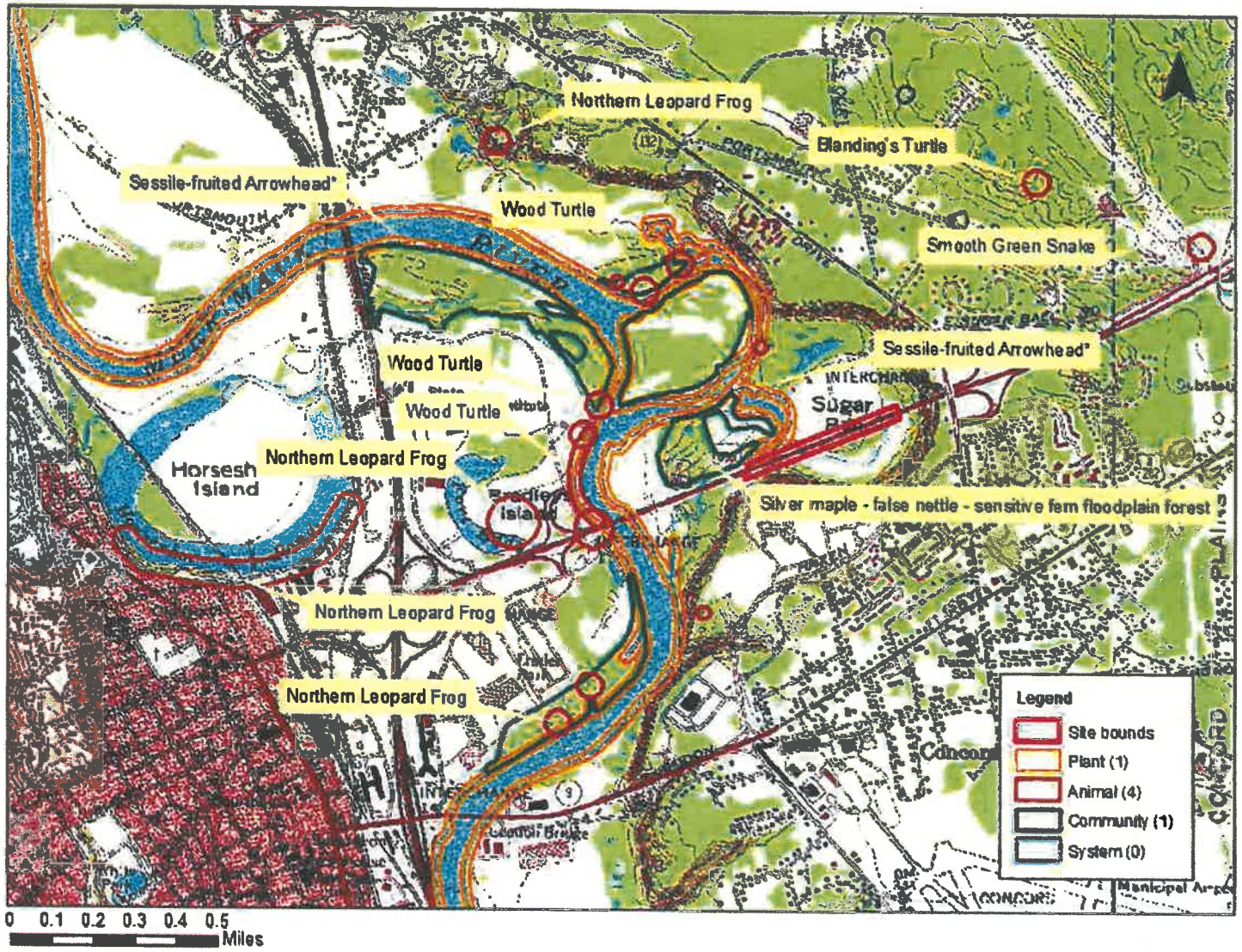
NH Natural Heritage Bureau
NHB Datacheck Results Letter

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Rd.
Concord, NH 03301

NHB16-0230


Northern Leopard Frog
Blanding's Turtle
Sessile-fruited Arrowhead*
Wood Turtle
Smooth Green Snake
Wood Turtle
Sessile-fruited Arrowhead*
Wood Turtle
Northern Leopard Frog
Horsesh Island
Silver maple - false nettle - sensitive fern floodplain forest
Northern Leopard Frog
Northern Leopard Frog
Legend
Site bounds
Plant (1)
Animal (4)
Community (1)
System (0)
0 0.1 0.2 0.3 0.4 0.5
Miles

New Hampshire Natural Heritage Bureau - Community Record

Silver maple - false nettle - sensitive fern floodplain forest

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Not ranked (need more information)
State:	Not listed	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Excellent quality, condition and landscape context ('A' on a scale of A-D).
Comments on Rank:

Detailed Description: 2009: Area 2: Mature silver maple forest, with overstory trees ranging from 16-36 inches diameter in interior areas (smaller diameters on trees around the margins of the island). While the interior portions of the island have vegetation that is typical for this community, a ~50m wide band of floodplain forest around the periphery of the island (presently included as part of this community type) exhibits floristic and ecological differences that warrant consideration of it as a separate type [an *ad hoc* name for such a separate type would be *silver maple grassy levee floodplain forest.*]. This association occurs on sandy levees, and is characterized by sand or sandy loam soils (coarser than interior areas), an absence of ferns, and an abundance of grasses, such as *Cinna arundinacea* (common woodreed), *Elymus* spp. (wheatgrass), and *Calamagrostis canadensis* (robust bluejoint). There is a remarkably low abundance of invasive species here compared to other portions of the occurrence and other sites. Nonetheless, invasives are present, and apparently best established at the southwest end of the island. Species include *Celastrus orbiculatus* (Asian bittersweet), *Berberis thunbergii* (Japanese barberry), including *Alliaria petiolata* (garlic mustard), *Lysimachia nummularia* (moneywort), and *Lonicera morrowii* (Morrow's honeysuckle). There is almost no *Toxicodendron radicans* (climbing poison ivy). 2006: Observed and photographed at Areas 1, 2, and 3. Major flooding in May left distinct bleaching lines high up on many of the silver maples.2003: SPNHF patch nearest the river (Area 1) is ***silver maple - false nettle - sensitive fern floodplain forest***, with a nearly pure canopy of silver maple and a sparse canopy of understory ferns. 2001: SPNHF patch (Area 1) observed and photographed. 1997: Four forest patches were observed. Tech Island (Area 2): *Acer saccharinum* (silver maple) dominated the canopy cover with some *Populus deltoides* (eastern cottonwood) within the releve. *Boehmeria cylindrica* (false nettle) and *Onoclea sensibilis* (sensitive fern) shared herb dominance with various graminoids. The entire island is a complex of large, old silver maple floodplain forest with a variety of canopy species, and various, patchy floodplain herbs and grasses. Concord Dump (Area 4): The *Acer saccharinum* (silver maple) dominant canopy overhung a fairly species poor herb layer with little to no subcanopy coverage. Sandy soils and flood debris were deposited throughout the floodplain, with grass and *B. cylindrica* (false nettel) patches scattered throughout. NHTI (Area 3): This site had a closed silver maple canopy with little to no subcanopy or shrub layer. *Boehmaria cylindrica* (false nettel), *Matteuccia struthiopteris* var. *pensylvanica* (ostrich fern), and *Onoclea sensibilis* (sensitive fern) dominate the understory, with lesser coverage of *Arisaema stewardsonii* [*triphyllum*] (Jack-in-the-pulpit), *Impatiens capensis* (spotted touch-me-not), *Cinna arundinacea* (common woodreed), and other herbs and graminoids. SPNHF (Area 1): *Acer saccharinum* (silver maple) floodplain forest patches of medium-low size and quality, due to the heavy trail use and extensive edges. *Carya ovata* (shagbark hickory), *Quercus rubra* (red oak), and *Fraxinus pennsylvanica* (green ash) share canopy space with silver maple, with *Toxicodendron radicans* (climbing poison ivy), *Celastrus orbiculatus* (Asian bittersweet), and *Berberis vulgaris* (European barberry) in the subcanopy/shrub layer, and *Onoclea sensibilis* (sensitive fern), *Matteuccia struthiopteris* [var. *pensylvanica*] (ostrich fern), *Boehmeria cylindrica* (false nettle), *Dactylis glomerata* (orchard grass), *Carex gynandra* (perfect-awned sedge), and *Eupatorium maculatum* (spotted Joe-Pye weed) in the understory.

General Area: 1997: Tech Island (Area 2): Good levee and slough channel development created a range of microtopographic variation. Soils ranged from coarse sand on levees to silty very fine sandy

loams in floodplain terraces. Huge piles of flood debris, with dead trunks and railroad ties, sit in low areas, indicating periodic flood deposition. Concord Dump (Area 4): The upstream end of this forest is framed by an old landfill. Old road beds, as well as the slopes framing the floodplain had considerable old dumping. Access points have considerable garbage. Edges were characterized by grassy openings, *Toxicodendron radicans* (poison ivy), and a recently used homeless structure near the upstream end. This floodplain had 1-4' deep slough channels throughout with a moderate size, stagnant pool in the deepest channel. Silty and very fine sandy loams had mottling throughout the soil column, with varying root depths. NHTI (Area 3): This floodplain complex is framed by parking lots of the Technical Institute, and a trail invites hiking travel through the center of the floodplain. Disturbance seems to be encouraging the growth of vines and invasive species near the edge of the floodplain patch. A shallow emergent marsh with associated standing-water vernal pool at the downstream end of the patch adds to the diversity of this floodplain complex. Soils indicate very active deposition periodically (yearly?): silty, sandy soils, distinct layering of buried organic material, extensive mottling, no soil horizon development. SPNHF (Area 1): A steep forested bluff frames the land side of this floodplain/marsh complex, with extensive trails, old fields, and some timber plantation areas within and around the floodplain as well. ***Rich sugar maple - oak - hickory terrace forest*** occurs on this terrace.

General Comments:

Management Comments: 1997: Easy access for hikers may increase trampling, off-trail dumping, etc. at this site.

Location

Survey Site Name: Merrimack River
Managed By: NHTI/Concord - Island Reserve

County: Merrimack
Town(s): Concord
Size: 136.6 acres Elevation: 220 feet

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Five patches of forest along the Merrimack River in Concord. Area 1 (SPNHF): from Exit 16 on I-93, turn right (south) on Rte. 132. Take first right onto Eastman Street (as Rte. 132 turns left uphill). After ca. 0.3 mile make a sharp left turn onto Portsmouth Street. Continue ca. 0.3 mile to small dirt parking lot on the right. Area 2 (Tech Island): access by canoe. From Rte. 393 in Concord, take Exit 1 onto Fort Eddy Road. Head north to a boat ramp on the east side of the road. The south end of the island is opposite and slightly upstream of the ramp.Area 3 (Tech or NHTI): from Rte. 393 in Concord, take Exit 1 onto Fort Eddy Road. Head north, and after ca. 1 mile the forest is between this road and the river. Area 4 (Concord Dump, a.k.a. Fort Eddy Rd): from Exit 15 on Rte. 93N in Concord, go straight at the exit ramp stop sign onto Fort Eddy Rd. The forest is on the bank of the river to the east of the road.Area 5 (Sugar Ball): From East Side Drive just north of Rte. 393 intersection, descend east on driveway.

Dates documented

First reported: 1997-07-02 Last reported: 2009-09-14

NHB16-0230 EOCODE: PMALI040N0*002*NH

New Hampshire Natural Heritage Bureau - Plant Record

Sessile-fruited Arrowhead (*Sagittaria rigida*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Endangered	State:	Not ranked (need more information)

Description at this Location

Conservation Rank: Historical records only - current condition unknown.
Comments on Rank:

Detailed Description: 1939: Specimen collected.
General Area: 1939: Sandy river shore.
General Comments:
Management Comments:

Location

Survey Site Name: Concord
Managed By: Sewall Falls WMA

County: Merrimack
Town(s): Concord
Size: 377.3 acres Elevation:

Precision: Within 1.5 miles of the area indicated on the map (location information is vague or uncertain).

Directions: Sandy shore of Merrimack River in Concord.

Dates documented

First reported: 1939-08-28 Last reported: 1939-08-28

NHB16-0230 EOCODE: ARAAD04010*188*NH

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank:

Detailed Description: 2006: Area 11753: 1 observed.
General Area:
General Comments: 2006: Area 11753: Found and released along power line ROW east of capture location.
Management Comments:

Location

Survey Site Name: Broken Ground
Managed By:

County: Merrimack
Town(s): Concord
Size: 1.9 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Broken Ground.

Dates documented

First reported: 2006-10-05 Last reported: 2006-10-05

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

NHB16-0230 EOCODE: AAABH01170*008*NH

New Hampshire Natural Heritage Bureau - Animal Record

Northern Leopard Frog (*Rana pipiens*)

Legal Status

Federal: Not listed
State: Special Concern

Conservation Status

Global: Demonstrably widespread, abundant, and secure
State: Rare or uncommon

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2004: 1 young frog observed (2004-0195). 10 seen. Adults and young. (Obs_id 2004.012). 5-7 seen. Adults and young. (Obs_id 2004.0166A,B,C). 1 seen. Adult. (Obs_id 2004.013). 2003: 1 adult seen (Obs_id 2003.0047). 2000: 1 adult seen (Obs_id 2000.0008).1996: Area 12188: 1 observed.

General Area: 2004: Field adjacent to oxbow wetland (Obs_id 2004-0195). Steep bank of boat ramp edge. Clumps of grass on damp ground. This area is a strip of trees between playing hills and the river, but was originally floodplain forest (Obs_id 2004.012). [Man-made pond.] (Obs_id 2004.013). 2003: Riverbank (Obs_id 2003.0047). 2000: Found in a window well at the SPNHF conservation center on 8/4 (Obs_id 2000.0008).1996: Area 12188: Horseshoe Pond.

General Comments: 2004: Smaller frogs very active. 2 adults were still (Obs_id 2004.012). 2000: Observer noted, "I haven't seen one in a long time. I thought you might be interested. Sorry about the quality of the photos, we only had a point and shoot camera available. They suffice for a positive ID though. Keep on herpin'" (Obs_id 2000.0008).

Management Comments:

Location

Survey Site Name: Merrimack River Floodplain
Managed By: Woodman

County: Merrimack
Town(s): Concord
Size: 47.3 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2004: NHTI, field adjacent to oxbow wetland (2004-0195). 2004: Floodplain forest on west side of Merrimack River in Concord. Boat launch under I-393 bridge (Obs_id 2004.0166A). Emergent marsh Inlet backwater of Merrimack River (Obs_id 2004.0166B). Grassy clearing along river behind mobile home park (Obs_id 2004.0166C). Across from the boat ramp at the NH Tech on Ft Eddy Road (Obs_id 2004.012). NH Fish &display pond [outside headquarters] (Obs_id 2004.013). 2003: Across from the boat ramp at the NH Tech on Ft Eddy Road (Obs_id 2003.0047, 2004.012). 2000: SPNHF Conservation Center (Obs_id 2000.0008).1996: Area 12188: South of Horseshoe Pond.

Dates documented

First reported: 1996-09-06 Last reported: 2004-08-24

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Smooth Green Snake (*Opheodrys vernalis*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Rare or uncommon

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2005: Area 11672: 1 seen.
General Area: 2005: Area 11672: Trail through wetlands.
General Comments:
Management Comments:

Location

Survey Site Name: Portsmouth St/393 ROW
Managed By:

County: Merrimack
Town(s): Concord
Size: 1.9 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2005: Area 11672: East of powerline at junction with Portsmouth Street.

Dates documented

First reported: 2005-07-01 Last reported: 2005-07-01

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

NHB16-0230 EOCODE: ARAAD02020*071*NH

New Hampshire Natural Heritage Bureau - Animal Record

Wood Turtle (*Glyptemys insculpta*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Special Concern	State:	Rare or uncommon

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2013: Area 13461: 2 adult females observed. 7 adults observed, sex unknown. 2012: Area 13090: 1 adult female observed. Area 13100: 1 adult observed. 2011: Area 13134: 4 adults and 1 juvenile observed. 2009: Area 12307: 4 individuals observed. 2006: Area 11686: 1 adult seen. 1996: Area 6455: 1 female seen.

General Area: 2013: Area 13461: Merrimack River. 2012: Area 13090: Merrimack River oxbow. Area 13100: Floodplain forest. 2009: Area 12307: Downed trees in river. 2006: Area 11686: Mostly woody, shrubby vegetation up the bank, but turtle was near an area where a wooden structure indicates a possible former dock, with a patch of grass standing out from an otherwise sparse herbaceous layer. Abundant sandy soil nearby, due to silting. 1996: Area 6455: Find sandy loam/silt of floodplain, supporting American elm, bittersweet, silver maple, etc. Turtle headed for the river from sandy lane between river-edge vegetation and cornfield.

General Comments:
Management Comments:

Location

Survey Site Name: Bradley's Island
Managed By: Merrimack River Outdoor Ed. & Consrv. Ctr.

County: Merrimack
Town(s): Concord
Size: 12.0 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13461: SPNHF Conservation Center. 2012: Area 13100: Eastman Cove vernal area, Merrimack River. 2009: Area 12307: In Merrimack River just north of NHTI boat ramp. 2006: Area 11686: Outside bend of Merrimack River below Sugar Ball. 1996: Area 6455: Merrimack River. At edge of shrubs, 20' from W bank of river, behind cornfield just south of NHTI ball field.

Dates documented

First reported: 1996-08-29 Last reported: 2013-04-25

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

Leach, Michael

From: Tuttle, Kim <Kim.Tuttle@wildlife.nh.gov>
Sent: Wednesday, February 03, 2016 8:28 AM
To: Leach, Michael
Subject: RE: 393 culverts- NHB15-0292 Concord and NHB16-0230

I made a few minor changes to update. -Kim

Michael,

The NHFG Nongame and Endangered Species Program has reviewed NHB16-0230 (same as NHB15-0292) for the proposed culvert replacements under I393 in Concord. The NHB database check indicated the following species in the vicinity of the project:

Bald Eagle (*Haliaeetus leucocephalus*) T --
Blanding's Turtle (*Emydoidea blandingii*) E --
Northern Leopard Frog (*Rana pipiens*) SC --
Wood Turtle (*Glyptemys insculpta*) SC --
1Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern

Our first choice for culvert material, without reservation, for these crossings is RCPs. Their rough surface and moisture and humidity holding capacity in dry situations is likely to attract turtles including the state endangered Blanding's turtle, frogs, and salamanders and other wildlife to use the pipes to cross under I-393 instead of ending up as road mortality because of the concrete divider barrier. If RCPs are not feasible, we are okay with the culvert replacements described below in your 9/3/15 email:

"As a follow-up to our discussion, the NHDOT is proposing to slip line the 36" pipe and understand that slip lining this 36" pipe with a smooth plastic pipe is acceptable. As for the new 48" and 54" replacement pipes that will be located adjacent to the existing pipes, a corrugated interior plastic pipe or a plastic pipe with a rough surface along the bottom half, such as an epoxy and sand mixture or something that provides a rough surface along the bottom half of the pipe, is acceptable to address the concern of Fish and Game under NHB16-0230 (NHB15-0292). Another alternative being considered at this time for the replacement 48" and 54" pipes is a concrete pipe."

We do not expect impacts to bald eagle as a result of the proposed culvert replacements as long as the removal of potential perching and roosting trees along the Merrimack River are avoided to the fullest extent possible. Please feel free to call me if you have any questions about this review.

Sincerely,

Kim Tuttle
Certified Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Leach, Michael [mailto:Michael.Leach@stantec.com]
Sent: Tuesday, February 02, 2016 4:33 PM
To: Tuttle, Kim
Subject: RE: 393 culverts- NHB15-0292 Concord and NHB16-0230

Hi Kim:

The original NHB15-0292 we submitted for the culverts expired last week and a new NHB was submitted for the project. NHB16-0230 is the new one for the same project. I am following up on the new NHB16-0230 to confirm that our same design, as noted below in our previous discussions, for the 3 culverts under I-393 is acceptable. Can you please confirm.

Thank you,

Mike

Michael Leach
Associate
Stantec
5 Dartmouth Drive Suite 101 Auburn NH 03032-3984
Phone: (603) 206-7538
Cell: (603) 203-3048
Fax: (603) 669-7636
Michael.Leach@stantec.com

From: Tuttle, Kim [mailto:Kim.Tuttle@wildlife.nh.gov]
Sent: Friday, September 04, 2015 9:07 AM
To: Leach, Michael
Subject: RE: 393 culverts- NHB15-0292 Concord

Michael,

The NHFG Nongame and Endangered Species Program has reviewed NHB15-0292 for the proposed culvert replacements under I393 in Concord. The NHB database check indicated the following species in the vicinity of the project:

Bald Eagle (*Haliaeetus leucocephalus*) T --
Blanding's Turtle (*Emydoidea blandingii*) E --
Northern Leopard Frog (*Rana pipiens*) SC --
Wood Turtle (*Glyptemys insculpta*) SC --
1Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern

Our first choice for culvert material, without reservation, for these crossings is RCP because of their rough surface and moisture and humidity holding capacity in dry situations to likely attract turtles including the state endangered Blanding's turtle, frogs, and salamanders and other wildlife to use the pipes to cross under I-393 instead of ending up as road mortality because of the concrete divider barrier. If RCPs are not feasible, we are okay with the culvert replacements described below in your 9/3/15 email:

"As a follow-up to our discussion, the NHDOT is proposing to slip line the 36" pipe and understand that slip lining this 36" pipe with a smooth plastic pipe is acceptable. As for the new 48" and 54" replacement pipes that will be located

adjacent to the existing pipes, a corrugated interior plastic pipe or a plastic pipe with a rough surface along the bottom half, such as an epoxy and sand mixture or something that provides a rough surface along the bottom half of the pipe, is acceptable to address the concern of Fish and Game under NHB15-0292. Another alternative being considered at this time for the replacement 48" and 54" pipes is a concrete pipe."

We do not expect impacts to bald eagle as a result of the proposed culvert replacements as long as the removal of potential perching and roosting trees along the Merrimack River are avoided to the fullest extent possible. Please feel free to call me if you have any questions about this review.

Sincerely,

Kim Tuttle
Certified Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Leach, Michael [mailto:Michael.Leach@stantec.com]
Sent: Thursday, September 03, 2015 5:25 PM
To: Tuttle, Kim
Cc: murban@dot.state.nh.us; Adams, Tim; Fortin, Gerard; CCarucci@dot.state.nh.us; DJELLIOTT@DOT.STATE.NH.US
Subject: RE: 393 culverts- NHB15-0292

Hi Kim:

As a follow-up to our discussion, the NHDOT is proposing to slip line the 36" pipe and understand that slip lining this 36" pipe with a smooth plastic pipe is acceptable. As for the new 48" and 54" replacement pipes that will be located adjacent to the existing pipes, a corrugated interior plastic pipe or a plastic pipe with a rough surface along the bottom half, such as an epoxy and sand mixture or something that provides a rough surface along the bottom half of the pipe, is acceptable to address the concern of Fish and Game under NHB15-0292. Another alternative being considered at this time for the replacement 48" and 54" pipes is a concrete pipe.

Could you please confirm that these alternates are acceptable for this project.

Thank you,

Mike

Michael Leach
Associate
Stantec
5 Dartmouth Drive Suite 101 Auburn NH 03032-3984
Phone: (603) 206-7538
Cell: (603) 203-3048
Fax: (603) 669-7636
Michael.Leach@stantec.com

From: Leach, Michael
Sent: Wednesday, September 02, 2015 5:10 PM
To: KIM.TUTTLE@WILDLIFE.NH.GOV
Subject: RE: 393 culverts- NHB15-0292

Hi Kim;

Pictures 503.1 are at the 48". Pictures 503.1.2 are for the 36". The other one is at the 54" culvert outlet. The culverts act as equalizer pipes and not located on watercourses based upon information provided by NHDOT to us. The 48" and 54" will remain in place during the boring process for the new pipes that will be located approximately 50 west of each existing pipe. The existing pipes will be filled after the new 48" and 54" pipes are installed and operational. The inlet and outlets areas of the new pipes will be excavated to connect and maintain the current hydraulic and equalizer condition and will have headwalls. The 36" pipe will be retained and slip lined. We are proposing to use smooth plastic pipe for all since the pipes end are submerged. None of the pipes have been previously slip lined.

Hope this helps,

Mike

Michael Leach
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Michael.Leach@stantec.com

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Please consider the environment before printing this email.

From: Leach, Michael
Sent: Wednesday, September 02, 2015 4:01 PM
To: KIM.TUTTLE@WILDLIFE.NH.GOV
Subject: 393 culverts- NHB15-0292

Hi Kim;

Here are the culvert locations. I will follow-up with a call

Mike

Michael Leach
Associate
Stantec
5 Dartmouth Drive Suite 101 Auburn NH 03032-3984
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Cell: (603) 203-3048

Fax: (603) 669-7636
Michael.Leach@stantec.com

Leach, Michael

From: Lamb, Amy <Amy.Lamb@dred.nh.gov>
Sent: Friday, February 05, 2016 3:06 PM
To: Leach, Michael
Subject: RE: NHB review: NHB16-0230

Hello Mike,

This message is a follow-up to NHB16-0230, for the review of culvert rehabilitation and replacement of 3 culverts under I-393 between Exits 1 and 2.

Thank you for providing coordinates for the culverts as well as the erosion control plans. I was able to overlay the coordinates on top of aerial photos and the NHB database records; the proposed work area for the 54" culvert is immediately adjacent to, but not within, the exemplary silver maple – false nettle – sensitive fern floodplain forest. Provided that the work area is limited to the area detailed in the erosion control plans (sheet 10, plan dated 10/2015), and appropriate erosion controls are in place (turbidity curtain or cofferdam) to prevent excessive sediment migration, NHB does not have concerns about this project.

The rare plant included in our review (*Sagittaria rigida*, sessile-fruited arrowhead) is an older, general-precision record, and it was determined that it is unlikely that the plant would be present in the project area.

If the project should change to include additional work or impacts to the exemplary natural community, please contact the Natural Heritage Bureau.

Thank you for coordinating with us.

Best,
Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Leach, Michael [mailto:Michael.Leach@stantec.com]
Sent: Wednesday, February 03, 2016 4:03 PM
To: Lamb, Amy
Subject: FW: NHB review: NHB16-0230

Hi Amy, Below are the state plane coordinates

Mike

Michael Leach

Associate
Stantec
5 Dartmouth Drive Suite 101 Auburn NH 03032-3984
Phone: (603) 206-7538
Cell: (603) 203-3048
Fax: (603) 669-7636
Michael.Leach@stantec.com

From: Adams, Tim
Sent: Wednesday, February 03, 2016 3:58 PM
To: Leach, Michael
Subject: RE: NHB review: NHB16-0230

Mike,

Here is a list of coordinates for Amy's use.

	Northing	Easting
54" Outlet	262988.9433	1024050.4836
54" Inlet	262809.3229	1024123.7093
48" Outlet	263231.6307	1024681.6560
48" Inlet	263115.1632	1024884.4707
36" Inlet	263785.9219	1025890.0709
36" Outlet	263473.4302	1025942.7450

Thanks,

Timothy Adams
Project Engineer
Stantec
Phone: 603-206-7535 ext 7535
Cell: 603-289-8429
Timothy.Adams@stantec.com

From: Leach, Michael
Sent: Wednesday, February 03, 2016 2:44 PM
To: Adams, Tim
Subject: FW: NHB review: NHB16-0230

FYI

Michael Leach
Associate
Stantec
5 Dartmouth Drive Suite 101 Auburn NH 03032-3984

Phone: (603) 206-7538
Cell: (603) 203-3048
Fax: (603) 669-7636
Michael.Leach@stantec.com

From: Lamb, Amy [mailto:Amy.Lamb@dred.nh.gov]
Sent: Wednesday, February 03, 2016 2:41 PM
To: Leach, Michael
Subject: RE: NHB review: NHB16-0230

State plane would be great.

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Leach, Michael [mailto:Michael.Leach@stantec.com]
Sent: Wednesday, February 03, 2016 2:40 PM
To: Lamb, Amy
Subject: RE: NHB review: NHB16-0230

Do you want state plane coordinates or lat and long?

Michael Leach
Associate
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5 Dartmouth Drive Suite 101 Auburn NH 03032-3984
Phone: (603) 206-7538
Cell: (603) 203-3048
Fax: (603) 669-7636
Michael.Leach@stantec.com

From: Lamb, Amy [mailto:Amy.Lamb@dred.nh.gov]
Sent: Wednesday, February 03, 2016 2:12 PM
To: Leach, Michael
Subject: RE: NHB review: NHB16-0230

Hi Mike,

Thanks for sending the plans. Do you happen to have GPS points for the culvert locations so I can overlay them and see if they are within the exemplary natural community area? Since the close-up plans don't show a lot of identifying features that help me locate the work on aerial photos, I am having some trouble determining if the work is within the exemplary area or just to the east of it. Thank you!

Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Leach, Michael [mailto:Michael.Leach@stantec.com]
Sent: Wednesday, February 03, 2016 10:23 AM
To: Lamb, Amy
Subject: RE: NHB review: NHB16-0230

Hi Amy:

As a follow-up to our discussion this morning attached are the plans for the project. The NHB was a renewal of NHB15-0292 that had expired. The previous NHB did not include the natural community or the plant species noted in the latest NHB. The project is to rehabilitate an existing 36" culvert by slip lining and replace the 48" and 54" culverts, that cannot be slip lined due to the poor pipe conditions, with new culverts of the same size to restore and maintain the current hydrology in the area. As we discussed, the project is still ongoing and the wetland permit will be submitted soon. The concern is that a natural community was unknown from the previous NHB and now would require mitigation.

Please e-mail or call with any questions.

Thank you,

Mike

Michael Leach
Associate
Stantec
5 Dartmouth Drive Suite 101 Auburn NH 03032-3984
Phone: (603) 206-7538
Cell: (603) 203-3048
Fax: (603) 669-7636
Michael.Leach@stantec.com

From: Lamb, Amy [mailto:Amy.Lamb@dred.nh.gov]
Sent: Thursday, January 28, 2016 4:01 PM
To: Leach, Michael
Cc: Tuttle, Kim
Subject: NHB review: NHB16-0230

Attached, please find the review we have completed. If your review memo includes potential impacts to plants or natural communities please contact me for further information. If your project had potential impacts to wildlife, please contact NH Fish and Game at the phone number listed on the review.

Best,
Amy

Amy Lamb
Ecological Information Specialist

NH Natural Heritage Bureau
DRED - Forest & Lands
172 Pembroke Rd
Concord, NH 03301
603-271-2215 ext. 323

I-393 CULVERTS CONCORD 16267 & 16288

US Army Corps of Engineers®
New England District

New Hampshire Programmatic General Permit (PGP)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See PGP, GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	**Yes**	**No**
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	X	
2. Wetlands	**Yes**	**No**
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, shellfish beds, special wetlands and vernal pools (see PGP, GC 26 and Appendix A)? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) website, www.nhnaturalheritage.org, specifically the book Natural Community Systems of New Hampshire.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X	
2.5 The overall project site is more than 40 acres.		X
2.6 What is the size of the existing impervious surface area? IN PROJECT AREA	≈3.8 Ac	
2.7 What is the size of the proposed impervious surface area? " " "	≈3.8 Ac.	
2.8 What is the % of the impervious area (new and existing) to the overall project site?	0%	
3. Wildlife	**Yes**	**No**
3.1 Has the NHB determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require a NHB determination.)	X	
3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.	X	

I-393 CULVERTS CONCORD 16287 & 16288

3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the PGP, GC 21?	X	
[illegible]	YES	NO
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	X	
[illegible]		
For a minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) shall be sent to the NH Division of Historical Resources as required on Page 5 of the PGP** SECTION 106 PROGRAMMATIC AGREEMENT	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.
** If project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law..

Stantec

Memorandum

To: Project File

From: Michael Leach
Stantec Consulting Services, Inc.

File: Concord 16287 &16288
Stantec# 195113112

Date: October 23, 2015

Reference: **NHDHR File Research for**
Interstate 393 Culvert Replacement and Rehabilitation
Wetland Permit Application
Concord 16287 and 16288

Applicant: **New Hampshire Department of Transportation**

On October 23, 2015, I conducted research at the New Hampshire Division of Historical Resources Building at 19 Pillsbury Street in Concord, NH. I examined The city of Concord files containing historical information concerning specific locations throughout the City. Based upon the information lists of the known addresses of area and individual surveys that have been conducted, as provided by the NHDHR Staff, I did not find any properties listed in close proximity to the project area referenced above.

If questions arise, please call me at (603) 206-7538.

STANTEC CONSULTING SERVICES INC.

Michael Leach,
Associate
Tel: (603) 669-8672
Fax: (603) 669-7636
michael.leach@stantec.com

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

Date Reviewed:	11/16/2015		
Project Name:	Concord - INTERSTATE 393		
State Number:	16287	**FHWA Number:**	X-A001(221)
Environmental Contact:	Michael Leach	**DOT**	
Email Address:	michael.leach@stantec.com	**Project Manager:**	Christopher Carucci
Project Description:	Rehabilitation/replacement of existing 36" CMP culvert and 48" CMP culvert under Interstate 393 using trenchless technologies		

Please select the applicable undertaking type(s):

☐	1. Modernization and general highway maintenance **that may require additional highway right-of-way or easement**, and which is **not within the boundaries of a historic property or district**, including:
	Choose an item. Choose an item.
☒	2. Non-historic bridge and culvert maintenance, renovation, or total replacement, **that may require minor additional right-of-way or easement**, and which is **not within the boundaries of a historic property or district**, including:
	a. replacement of maintenance of drainage pipes and culverts made of steel, plastic and concrete Choose an item.
☐	3. Historic bridge maintenance activities within the limits of existing right-of-way, including:
	Choose an item. Choose an item.
☐	4. Stream stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions).
☐	5. Construction of bicycle lanes and pedestrian walkways, sidewalks, shared-use paths and facilities, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons, **not within the boundaries of a historic property or district**.
☐	6. Installation of bicycle racks, **not within the boundaries of a historic property or district**.
☐	7. Recreational trail construction, **not within the boundaries of a historic property or district**.
☐	8. Recreational trail maintenance when done on existing alignment.
☐	9. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, **not within the boundaries of a historic property or district, and no historic railroad features are impacted**, including, but not limited to:
	Choose an item. Choose an item.
☐	10. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements
☐	11. Installation of Intelligent Transportation Systems.

Please describe how this project is applicable under Appendix B of the Programmatic Agreement.

Rehabilitation/replacement of existing 36" CMP culvert and 48" CMP culvert under Interstate 393 using trenchless technologies. All work is proposed within the existing right of way. The culverts were constructed in the 1980's according to NHDOT records.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

NHDOT in-house projects: Please append photographs, USGS maps, design plans and as-built plans, if available, for review.
LPA projects: Please submit this Certification Form along with the Transportation RPR

Coordination Efforts:

Has an RPR been submitted to NHDOT for this project?	Yes	NHDHR R&C # assigned?	Click here to enter text.
Please identify public outreach effort contacts; method of outreach and date:	Letters were sent to abutters on 4/28/2015 and cc'ed the Concord City Manager		

Finding: (To be filled out by NHDOT Cultural Resources Staff)

☒	**No Potential to Cause Effects**	☐	**No Historic Properties Affected**
This finding serves as the Section 106 Memorandum for your environmental documents, no further coordination is necessary.			
☐	This project does *not* comply with Appendix B, and will continue under the Section 106 review process outlined in 36 CFR 800.3-800.7. Please contact NHDOT Cultural Resources Staff to determine next steps.		
NHDOT comments:			

NHDOT Cultural Resources Staff — Date: 11/20/2015

Coordination of the Section 106 process should begin as early as possible in the planning phase of the project (undertaking) so as not to cause a delay.

Project sponsors should not predetermine a Section 106 finding under the assumption that an undertaking conforms to the types listed in Appendix B until this form is signed by the NHDOT Bureau of Environment Cultural Resources Program staff.

Every project shall be coordinated with, and reviewed by the NHDOT-BOE Cultural Resources Program in accordance with the Cultural Resources Programmatic Agreement among the Advisory Council on Historic Preservation, Federal Highway Administration, NH Department of Transportation, and the State Historic Preservation Office. In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

If any portion of the undertaking is not entirely limited to any one or a combination of the types specified in Appendix B (with, or without a portion that is included as a type listed in Appendix A), please continue discussions with NHDOT Cultural Resources staff.

This No Potential to Cause Effect or No Historic Properties Affected project determination is your Section 106 finding, as defined in the Programmatic Agreement.

Should project plans change, please inform the NHDOT Cultural Resources staff in accordance with Stipulation VII of the Programmatic Agreement.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

Date Reviewed:	11/16/2015		
Project Name:	Concord - INTERSTATE 393		
State Number:	16288	**FHWA Number:**	X-A001(222)
Environmental Contact:	Michael Leach	**DOT**	
Email Address:	michael.leach@stantec.com	**Project Manager:**	Christopher Carucci
Project Description:	Rehabilitation/replacement of existing 54 CMP culvert under Interstate 393 using trenchless technologies		

Please select the applicable undertaking type(s):

☐	1. Modernization and general highway maintenance **that may require additional highway right-of-way or easement**, and which is **not within the boundaries of a historic property or district**, including:
	Choose an item. Choose an item.
☒	2. Non-historic bridge and culvert maintenance, renovation, or total replacement, **that may require minor additional right-of-way or easement**, and which is **not within the boundaries of a historic property or district**, including:
	a. replacement of maintenance of drainage pipes and culverts made of steel, plastic and concrete Choose an item
☐	3. Historic bridge maintenance activities within the limits of existing right-of-way, including:
	Choose an item. Choose an item.
☐	4. Stream stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions).
☐	5. Construction of bicycle lanes and pedestrian walkways, sidewalks, shared-use paths and facilities, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons, **not within the boundaries of a historic property or district**.
☐	6. Installation of bicycle racks, **not within the boundaries of a historic property or district**.
☐	7. Recreational trail construction, **not within the boundaries of a historic property or district**.
☐	8. Recreational trail maintenance when done on existing alignment.
☐	9. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, **not within the boundaries of a historic property or district, and no historic railroad features are impacted**, including, but not limited to:
	Choose an item. Choose an item.
☐	10. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements
☐	11. Installation of Intelligent Transportation Systems.

Please describe how this project is applicable under Appendix B of the Programmatic Agreement.

Rehabilitation/replacement of the existing 54" CMP under Interstate 393 using trenchless technologies. All work is proposed is within the existing right of way. The culvert was constructed in the 1980s according to NHDOT records.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

NHDOT in-house projects: Please append photographs, USGS maps, design plans and as-built plans, if available, for review.
LPA projects: Please submit this Certification Form along with the Transportation RPR

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Please identify public outreach effort contacts; method of outreach and date:	Letters were sent to abutters on 4/28/2015 and cc'ed the Concord City Manager		

Finding: (To be filled out by NHDOT Cultural Resources Staff)

☒	**No Potential to Cause Effects**	☐	**No Historic Properties Affected**
This finding serves as the Section 106 Memorandum for your environmental documents, no further coordination is necessary.			
☐	This project does *not* comply with Appendix B, and will continue under the Section 106 review process outlined in 36 CFR 800.3-800.7. Please contact NHDOT Cultural Resources Staff to determine next steps.		
NHDOT comments:			

NHDOT Cultural Resources Staff — Date: 11/20/2015

Coordination of the Section 106 process should begin as early as possible in the planning phase of the project (undertaking) so as not to cause a delay.

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This **No Potential to Cause Effect** or **No Historic Properties Affected** project determination is your Section 106 finding, as defined in the Programmatic Agreement.

Should project plans change, please inform the NHDOT Cultural Resources staff in accordance with Stipulation VII of the Programmatic Agreement.